THE green scene

HORTICULTURE IN THE DELAWARE VALLEY

SEPTEMBER • OCTOBER • 1978 $1.50

Host to Butterflies.
See page 30.


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HORTICULTURE IN THE DELAWARE VALLEY

Volume 7, Number 1 Sept./Oct. 1978

published by
THE PENNSYLVANIA
HORTICULTURAL SOCIETY
325 Walnut Street, Philadelphia, Pa. 19106

THE GREEN SCENE, Volume 7, No. 1, published bimonthly, January, March, May, July, September, November, by the Pennsylvania Horticultural Society, a non-profit membership organization at 325 Walnut Street, Philadelphia, Pa. 19106. Subscription: $7.50 — Single Copy: $1.50. Second class postage paid at Philadelphia, Pa. 19104.

POSTMASTER: Send Form No. 3579 to THE GREEN SCENE, 325 Walnut Street, Philadelphia, Pa. 19106.

in this issue

Front Cover: Yellow swallowtail on butterfly weed. photo by Bebe Miles

Back Cover: *Pennisetum alopecuroides* (foreground) at Brookside Gardens in Wheaton, Md. photo by Karla Patterson

CORRECTION: Helen Knauff was incorrectly identified as the photographer of the pictures on pages 36 and 37 of the July issue of *Green Scene*. Patricia Knauff photographed the dried flower arrangements. Patricia Knauff just received her associate's degree from Temple University, Ambler Campus, in August.

THE PAVILION:
pleasurable even in the city

by Ann E. McPhail

1

2

photos by Ann E. McPhail

3

Pavilion is used to work (1), to dry herbs (2) and to store equipment (3).

"On couches with linings of brocade shall they recline, and the fruit of the gardens shall be within easy reach" (from the Koran).

Although it sounds wonderful it is not exactly the type of pavilion that I am about to describe. This type of dual purpose building could fit into many rear gardens in the city. It would allow 16 ft. to 19 ft. of space between it and the house for a garden. And since the building is designed to fit into a corner its bulk is minimized and the two level roof line gives needed height for proportion as well as for practical reasons. An exit to the rear street is also accommodated under the roof. Positioning the building at the rear of the lot creates a high back wall and roof to cut down on the inner-city noise and gives almost complete privacy. In addition, when seated you have a panoramic view of the garden. It's almost like being in the country. I do not feel that the building is a luxury, instead I feel that it is a very practical solution to a number of problems.

My garden consists of parts of three house lots. (See *Green Scene* May-June 1977.) I do have space next to the pavilion for a compost storage bin, a pair of cold frames and a small propagating bed. The compost bin produces seven or eight bags of sifted compost twice a year. This summer the yield will be especially rich as a friend brought me several bags of well-aged horse manure. At least part of the yearly yield has to be stored in the pavilion. A garden of this size and complexity requires a variety of insecticides, fertilizers, potting soil, pots, tools, and hoses. A set of garden furniture used on the side patio is stored there in the winter. Owning a typical high and narrow town house requires a number of ladders of varying lengths. My husband and I enjoy bicycling in the park in the summer, hence the need to store two bicycles. I grow and dry my own herbs and have found the pavilion room (which is concrete block) a dry place to hang them. These are some of the reasons for having such a work-storage room.

continued

◀ Pavilion dining area

what goes on in this pavilion

How can all this be going on in a modified triangular area approximately 18 ft. x 10 ft. x 10 ft.? It does get a little wild at times and has to be reorganized like any work-storage area. The high roof accommodates the ladders, and the aluminum patio furniture is hung from hooks placed along the ceiling. On the back or street wall two windows are placed high over a series of shelves used to store pots, insecticide and liquid fertilizers. The room, including the roof, is painted white to create additional light. There is also a fluorescent light over the workbench. The workbench fits snugly into two angles of the room next to the shelves. Pegboard is attached to the walls above the bench for hanging small tools, hose fittings, twine and other odds and ends. Bags of fertilizer and compost are stored under the bench and a large trash can of potting soil mix sits alongside it. We always take sterilized commercial potting soil and cut it with gritty sand and peatmoss. Also in this area there are extra bags of peatmoss, potting soil and sand. Our bicycles hang on brackets off the floor on the fourth wall. Next to them on the last wall are pegs for hanging larger garden tools, brooms and sprinklers. Room is left over for a wheelbarrow and garden cart and for me to work.

An added feature to drying herbs in the pavilion has been the wonderfully pungent aroma that pervades the building all summer. We harvest the herbs as soon as they start to form flowers because the aromatic oils in the leaves are most concentrated then. My husband found some narrow but sturdy plastic strips in a hardware store and he screwed them onto the front edge of several shelves. Here small bunches (smaller the better) of herbs are held by the strips. Larger herbs such as woody stalks of basil and fennel are suspended from the ceiling beams. The only problem here is when my husband wants to get a ladder out. There have been times shortly after harvesting the larger herbs in the fall when he has threatened to use a machete and cut his way to the ladders.

There have been times shortly after harvesting the larger herbs in the fall when he has threatened to use a machete and cut his way to the ladders.

This work-storage room is not a pretty room but it is a place I enjoy as I like the convenience of the proper tools and materials around me. For a number of years before the pavilion was constructed, on the days I worked in the garden, I had to go down into the basement of the main house countless times for tools and supplies. To say the least I found it a rather self-defeating exercise.

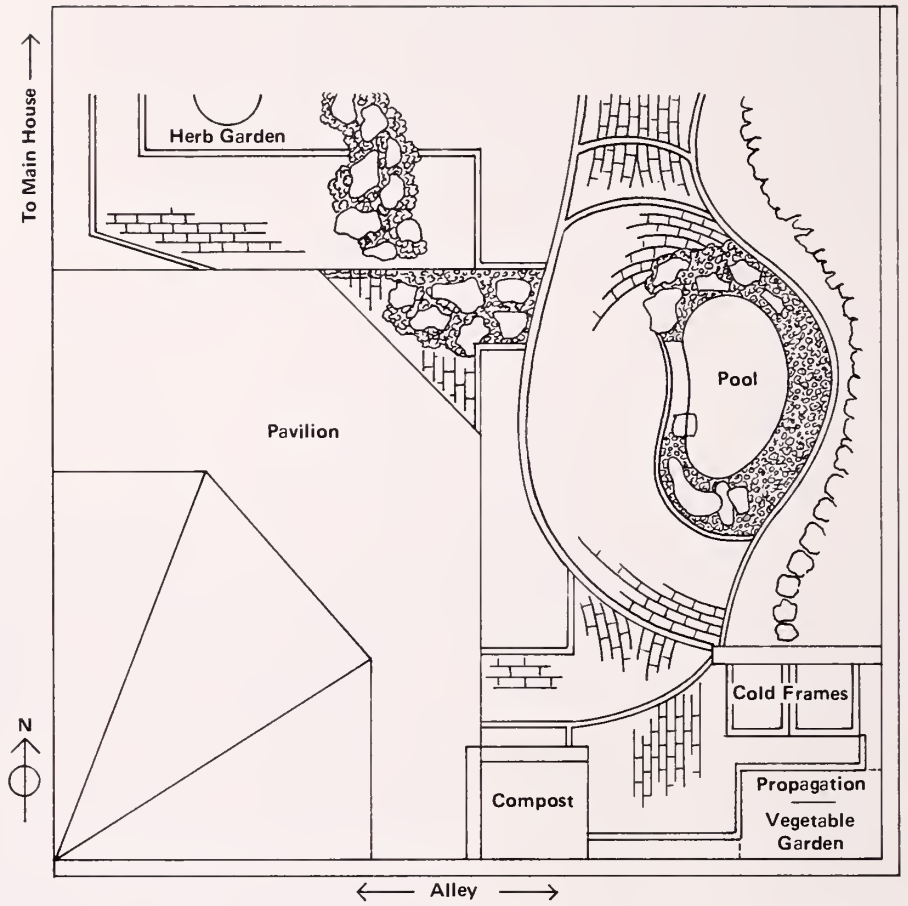
As I have indicated earlier the cold frames, small propagation-vegetable garden and compost bin area adjacent to the pavilion are an intrinsic part of it. The cold frames are used most of the year as either holding or propagation beds. During the winter months the few bonsais that I play around with are taken out of their pots and sunk in the cold frames and the pots stored in the pavilion. In early spring when new growth starts the bonsais are removed and placed in the small adjacent propagation bed to hold them until the weather moderates a little. Then they

continued

The tree-like plant growing out of the cold frame is fennel, which the author brings to a friend who owns a fine French restaurant in northern Maine. The proprietor proudly parades the huge bush of dried fennel through the dining room and uses it throughout the year on the elegant fish dishes served there.

Before pavilion was created

After



are pruned and potted in fresh soil and moved to the side patio. Cuttings of herbs taken last fall and scented geraniums that I particularly liked are brought out from a large light unit in the basement of the main house and put in the cold frames—later to be placed in the herb garden. Market-pacs of petunias, coleus and bedding begonias are put in the cold frames for planting out later after the small bulbs and pansies have died back. During the summer this area is used for chrysanthemums and amaryllis bulbs. In the fall the cycle starts again. The cold frames are only 5 ft. x 2½ ft. and are constructed with cinder block footings, redwood frames and plexiglass.

After the bonsais are removed from the propagation-vegetable garden we set in lettuce and parsley plants and later basil seed is sown for the summer. It is such a tiny area, 8½ ft. x 4½ ft., but it offers a service throughout the growing season of holding and producing. Against the rear wall I keep a large topiary hibiscus. Its coral pink flowers keep my dining room in bloom all summer. I do remove it from its pot and plant it in the ground. Hibiscus seem to retain a relatively small root ball. Other plants and cuttings are lined up beside it. The shadow cast by the rear wall is enough to keep the cuttings moist. Often I start cuttings of house plants early in the summer so that I can discard the old plant in the fall.

The compost bin is something that every garden should have, if possible. It takes much of what most people grind up and throw away plus the garden clippings. The one we have is only 4 ft. x 4 ft. yet the yield is high—12 to 14 bags. After the heavy snows this winter the garden had sunk in several areas and the compost was most valuable in building up these areas. So many things can be accomplished in a relatively small area that much of what is being discussed here is feasible in many city gardens. In this garden these features are architecturally integrated and disguised and yet function efficiently with the pavilion.

socializing

The social aspects of the pavilion are more obvious to the visitor. Comfortable wicker furniture is used in the sitting area and in the dining area, a slate top table (which often doubles as a work table) and metal ice-cream chairs. Many of the indoor tropical plants are kept here during the summer. The walls are white and provide an abundance of reflected light, which appears to be sufficient to promote normal growth. Some of the plants surrounding the dining area are *Monstera deliciosa* (split leaf philodendron), *Schefflera actinophylla,* dracaena, hoya, chlorophytum (spider plant), *Asplenium nidus* (bird's-nest fern), *Davallia griffithiana* (rabbit's-foot fern), and *Howea forsterana* (paradise palm) and the graceful *Pseudosasa japonica* (Metake bamboo). One does have to brush aside a few things when entering the dining area. Only about four to six people can be accommodated at the table and no more than eight at a small buffet. It is an intimate and private place. As often as possible we have both breakfast and dinner here during the summer. It is truly a pleasure pavilion in so many ways. Just sitting for awhile on a hot day looking out at the garden from under the awning of wisteria leaves — the refreshing sight of pale green ferns, bamboo, and the sound of water splashing from the fountain in the pool nearby. Or, late in the evening when the moonlight creates its own light and shadow. The city has become quiet, a cricket sings and a few fireflies wink in the trees. Just for a moment I am reminded of the pleasure pavilions in the Arabian Nights.

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Ann E. McPhail's city garden story in the May '77 issue of *Green Scene* so impressed the gardening editor of the *New York Times* that she came down to interview her for a story in that paper. Among her many horticultural activities, including a continuing active involvement with the 18th Century Garden at PHS, she lectures on the history of herbs and on city gardens. For many years she has been a guide at the Philadelphia Museum of Art.

The Disappearing Folk Figure:

Are Scarecrows Ready for a Comeback?

by Judy Naftulin

My search began on a hot summer day. I drove down rural roads, optimistically expecting an eyeful. He was out there and with a little luck, I was going to find him. But the search went on and the scarecrow, this "who" I was looking for, was nowhere in sight. The birds, on the other hand, were everywhere, especially the blackbirds and starlings. They seemed to be enjoying life down on the farm, as they sat motionless atop corn stalks. Perhaps they were wondering about me as I wondered about them. Finally, I deduced that all of these creatures in front of me were big and plentiful because they were so well fed, at someone else's expense, of course.

Don't the farmers and gardeners believe that scarecrows would keep varmints away? At that point, I knew collecting data on scarecrows around Bucks County wouldn't be easy. I hated to admit that these stuffed fellows of field may be a thing of the past. At least they're not very popular folk figures anymore.

Nostalic gardeners know about the scarecrow tradition, though. The scarecrow custom was first introduced into rural America during Colonial times by European immigrants. The heyday of this folk figure was in the late 1800's especially in New England. Set up at planting time, the scarecrow was spontaneously assembled in the image of a man. He had one purpose—to strike fear in marauders of the field. By the end of the season, the tattered effigy, usually made of crossed sticks, cast-off clothing and stuffed with straw, was only a shade of his former self. Weathered and worn from outdoor elements, the scarecrow was left to disintegrate over the winter. A new scarecrow was assembled the following season, featuring the whims and fancies of the creator.

This keeper of the crops had much respect back then. In the book *Ephemeral Folk Figures,* Avon Neal says, "The Colonists used scarecrows extensively as they heeded the planter's adage and dropped five kernels into each hill of corn, saying 'one for the woodchuck, one for

continued

Folk Figure: continued

photo supplied by W. Atlee Burpee

Burpee's Farmer Fred scarecrow

photo by Judy Naftulin

Linvilla Orchard scarecrows

Watch for an electrifying solution to home gardening pests. Scheduled for spring publication in . . .
THE green scene

photo by Judy Naftulin

At Linvilla Orchards in Media many handcrafted scarecrows amuse visitors as they buy their Halloween pumpkins.

the crow, one for the cutworm and two to grow.'" It was an ongoing battle to keep pests away from the garden in those days. And, it still is today.

The change from an agrarian society to an industrial one in America was the major reason for the demise of the scarecrow, as we know it. Some gardeners in Bucks County hang on to the tradition, though. Linda Tabas, a Solebury gardener, swears by her "friend in the field." Like other stalwart scarecrow gardeners, she suggests moving the scarecrow to a different spot in the garden occasionally, to be most effective. She also suggests changing his attire often. In the Tabas garden, you may see the scarecrow dressed in an old pinstripe suit one day and the next he may be decked out in a bright yellow raincoat. This all may sound time consuming and it is. But pests are clever creatures, especially the birds.

I was bothered by the fact that I could not find some more traditional scarecrows in the area. The reason for my poor luck was because the contemporary scarecrow sports a new look. To be effective, he has to. Today a scarecrow must overcome modern technology to scare the modern pest, whether it be a blackbird, pheasant or deer. The slighest movement or noise was once enough to keep unwelcome guests away from the garden. Pests are now more sophisticated. They are accustomed to automobiles and the flashing lights, sound and quick movement associated with them. A straw man does little to scare off crop ravagers, when even speeding cars going by so closely fail to do the trick.

Instead, farmers have turned to other methods of chasing away birds. The Avalar System, for example, is an electrical bird-scare device used for the job. Propane guns serve the same purpose.

Lawrence Swartley, a Buckingham farmer, takes all his pest problems in stride. His father used to plant seed corn that was treated with black tar as a deterrent. Today Swartley uses a chemical preparation. His biggest pest problem is the pheasant. "They'll dig deep into the soil to get what they're after," he says. If the problem gets too bad, Swartley sprinkles shell corn on top of the fields, feeding the pheasants to keep them away from digging up the good corn seed.

But what does the family gardener do to save his little plot of land from greedy pests? Besides organic methods and the use of chemicals, lots of people I talked with rely on dangling aluminum plates around the garden. The plates move in the breeze and catch the sunlight with their shiny surface. It is an adequate method, not foolproof, but easy enough to rig up every season. Other gardeners have different methods of warding off trespassers. Kathy Glanzman of Warrington hangs lightweight, dried gourds in her vegetable patch. These sway in the wind, rattling the seeds inside.

. . . one for the woodchuck, one for the crow, one for the cutworm and two to grow.

Pieces of cloth, streamers of aluminum foil, alarm clocks set to go off at different times and whirligigs are all used as pseudo-scarecrows. One woman told me the only days she doesn't have a problem with pests getting into her vegetable plants are when she is cooking sauerkraut. Her kitchen is close to the garden and the odor of the kraut seems to offend them; she calls it the "scarekraut" method.

Lee Mundhenk of Doylestown uses reverse psychology. She grows cantaloupes just for the pheasants. The melons are ravaged but thankfully other things growing in her garden are usually left alone. "One day I'd like to trade a tomato for a cantaloupe with those pheasants," she confesses. "But then I'm afraid they'll get a taste for my tomatoes, as well as the cantaloupes."

The scarecrow then as we used to know it is not completely gone from the countryside. He just looks a little different from the straw stuffed man of yesterday. George Wilson of Plumsteadville has created a tin can man that he dismantles and uses over again every season. The cans, stripped of their labels, glimmer in the sunlight and make a gentle clunking noise in the breeze. "He works quite well," according to Wilson. Mr. and Mrs. Austin Mims of Doylestown are fond of Farmer Fred, their inflatable Burpee scarecrow. He might not be too scary, but he is colorful and a welcome addition to their garden. Now who would have thought, a few years back, that there would be a plastic, inflatable scarecrow available?

No doubt we will have to continue to put up with pests on the farm and in the garden. According to Dick Bailey, Bucks County Agricultural Extension Agent, there are more birds now than ever before. With more birds and other varmints to contend with, new scarecrow devices will probably come onto the market, in the interest of keeping these ravagers of our fields away. But where does that leave the traditional scarecrow, the folk figure of our past that is not as utilitarian as he used to be?

Mr. Bailey, for one, believes the old-fashioned scarecrow is making a comeback. I think he is right. Even without gardens to protect, you now see scarecrows on front lawns or greeting guests near the front door. Next season I will begin my search once again, with hopes of finding more scarecrows than I did this year. The real scarecrow of yesteryear may not scare pests away anymore, but it is always a pleasure to run across these stuffed fellows of the field. They are a part of our gardening heritage. A part that is too good to lose.

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A former editor at *House Plants & Porch Gardens* magazine, Judy Naftulin is now a freelance garden writer for such publications as *Apartment Life*. She has a journalism degree from Temple and hopes to complete her horticulture degree there in the fall.

Paphiopedilum venustum showing new root growth after two months in bed of live sphagnum moss (note the rosette form).

photos by Alistair Rutherford

LIVE SPHAGNUM MOSS- a versatile

by Kenneth and Marie Smeltz

About six years ago when we became serious indoor gardening hobbyists one of the first really exciting plant materials to come along was live sphagnum moss. The dried sphagnum products available in garden stores were familiar, particularly when used to combat the fungus that causes damping off of seedlings. Live sphagnum moss, however, as a culture medium proved to have several unique applications.

Many of our light gardening friends had used live moss to propagate the usual houseplant cuttings—coleus, impatiens, creeping fig, piggyback plant, ivies, begonia leaves and others. We first used the live moss with spectacular results to root gardenia cuttings in a terrarium using trimmings from pruning. The cuttings were about 6 in. long and when placed in this stable, humid environment, they showed signs of root development in about two weeks and by two months had amazing root systems. We've repeated this procedure at least five times with similar results. In several cases, the cuttings retained buds that subsequently flowered. The experience with the gardenia cuttings was so remarkable that it led to a frequent joke at our house. We concluded that if the thumb is held in live sphagnum long enough it will probably root.

We were so impressed with our success that we felt the live moss must have uses in our orchid growing hobby. Live sphagnum was used in the early days of orchid culture as the potting medium for various genera. Over the years it was replaced by other potting mixes and growing techniques. Most of the ideas described here expand on the knowledge gained in the late 19th and early 20th centuries.

Several years ago, we found ourselves with three badly contaminated flasks containing replated* phalaenopsis seedlings. Having no facilities or medium to do another replating, the live sphagnum seemed to be a natural as a last ditch substitute to keep our seedlings alive. As it turned out, the seedlings thrived. Even the smallest protocorms,** having no roots, developed into sturdy plantlets. The preparation of the plantlets was quite simple. They were removed from the flask and given a spray washing with water. Then, they were soaked for about five minutes in a dilute solution of Clorox (1 to 8 by volume). They were then spray-rinsed with nonchlorinated water and soaked in nonchlorinated water for about 10 minutes. A final rinse with the hand sprayer using nonchlorinated water and they were ready to place in the live sphagnum terrarium. The plantlets were put on top of the moss, carefully to avoid burying them. This simple solution with its excellent results seemed even more useful than our gardenia success. So we were off and running, looking for other uses.

*Replating: transplanting orchid seedlings out of a sterile germinating flask into a sterile flask containing a nutrient medium designed to promote growth. Transplanting usually takes place when root growth is evident in the mother flask. Because of the mass of seedlings usually present in the mother flask, 8 to 10 flasks may be needed to accommodate the replated plantlets from one germination flask.

**Protocorm. The first growth. A tuber-like body produced by a germinating orchid seed before leaves and roots are formed.

Propagating box of live sphagnum with variety of cuttings—ivy, mini-fittonia, Swedish ivy, piggy-back plant. At top center note roots of *Dendrobium phalaenopsis* making new plantlet out of top of old pseudobulb.

medium for orchids and other plants

Moss terrariums are ideal homes for replating seedlings of several genera—cattleya, paphiopedilum, phalaenopsis, and hard-leaved oncidiums (equitants and mule-eared). The one soft-leaved oncidium we tried, however, did not do well and had to be removed.

Mature plants that have become dessicated can often be revived by placing them in the high humidity of the terrarium. If the root system is in good condition, the plant can be left in its pot. However, if lack of roots is the cause of the dessication, then remove the plant from its pot and clean the potting medium from the root area with a stream of water. Put the plant in the moss, being careful not to pack the moss too tightly about the crown. The new root growth has been remarkable in most cases. In our few failures, we suspect the pretreatment of the plants with insecticides containing petroleum derivatives may have been a contributing factor. It seems possible that the chemicals may disrupt the plants' metabolism by clogging its vital systems. The overall results seem consistent enough to make live sphagnum the first choice to save orchids that might otherwise die.

Another interesting use, which simplifies the usual procedures, is for stem propagation of phalaenopsis. Use a piece of stem about 3 or 4 in. long with an unflowered node at its center. Carefully peel off the node covering to expose the growth bud. Lay the stem in the moss with both ends covered. The percentage of success is relatively low. If successful, however, a plantlet will form at the node. It takes great patience at this point because roots are slow to form. It appears that roots will only show after the appearance of the second leaf on the plantlet.

We concluded that if the thumb is held in live sphagnum long enough it will probably root.

The moss may also be used as a potting medium. For potting phragmipedium, one half of the pot can be filled with regular paphiopedilum mix and then the top half of the pot is filled with moss. The phragmipediums thrive in the moist layer. Some growers are trying it as a potting medium for phalaenopsis; we have used it for them with limited success as a top dressing.

At this point you may be wondering where you find such a wonder plant. Surprisingly, sphagnum moss has 300 plus species. They range in appearance from long, slender, almost grass-like forms to the fleshy, many segmented rosette forms. It can be found in temperate to subarctic regions. It is present in acidic, swampy areas—ponds, bogs, lake shores and other places.

preparing for use

We have gotten our best results when we've thoroughly cleaned the gathered moss. We soak it in nonchlorinated water and gently agitate. You must hand-pick and remove all decaying foreign matter. Also, be on the lookout

continued

Live sphagnum moss terrarium containing several stem propagations of phalaenopsis orchids. Note two leaves of developing plantlets in foreground. Taping stems simplifies identification.

for bush snails, they seem to love the mossy mats. During the soaking they will usually float away from the moss, particularly when agitated. A pinch of the thumb and forefinger then quickly dispatches them. This cleaning is tedious; however, it is worth it. When the moss is not cleaned well, the terrarium quickly becomes foul smelling and the moss does not grow well. The cleaned moss is then used as the finishing layer in a closed growing chamber—fish tank, plastic sweater or shoe box. The base for the moss layer is about ¾ to one inch of clean pea gravel covered by a thin layer of clean pine needles. The pine needle layer supplies the acid situation that live sphagnum grows in naturally. We gather needles from a white pine as soon as they drop so that they will be clean. The addition of the pine needle layer has helped to keep the moss in tip-top condition. To finish the job you add about ½ inch of non-chlorinated water in the bottom of the container. One caution—the moss needs air, so cover the surface sparingly, not packing the moss too closely.

The plants in the terrarium are misted daily; every fourth day or so, we mist lightly with very dilute liquid fertilizer (30-10-10), which does not harm the moss. However, beware of introducing chlorinated water, insecticides, and other chemicals. They can be quick death to a lush green carpet of moss. Slugbait products, fortunately, do not harm the moss. The terrariums seem to do best when allowed to breathe a bit, so we leave the lids cracked most of the time. If you follow these simple steps, the moss should flourish. As a matter of fact, some of the same moss has been growing for us for three years. If it becomes too long and threatens to engulf the seedlings, it can always be trimmed and used to start new growth boxes. We experiment with the moss in our basement under fluorescent lights. The lights are about 2 ft. above the top of the terrariums and are on 14 hours in winter and 16 hours in summer. We have noticed that if the temperature is at 80° F or more for an extended period of time, the moss's growth is inhibited.

One last note. With time and patience, the dried long-fibered sphagnum available at garden stores will often produce a fine stand of live moss. Apparently spores in the dead moss respond to the ideal conditions in the terrarium and come to life. It may take 8 to 12 months for this to happen.

We hope the wonders of live sphagnum moss and its uses for plant rehabilitation will open new doors for many of you. We have found it a rewarding culture medium.

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Ken Smeltz (Ph.D.) is an organic chemist doing research for the E. I. DuPont de Nemours Co. He is currently president of the Delaware Orchid Society. Marie is past president of the Delaware Indoor Light Gardening Society and serves on the Board of The Wilmington Garden Center. She edits the *DOSsier,* the monthly newsletter of the Delaware Orchid Society.

our roots

by William M. Klein, Jr., and Marilyn B. Peterson

In the world of high rises and pavements, quite often the only underground thing we notice is the subway.

It is in the underground, however, where a battle for survival rages, unrecognized and untreated because it is obscured from view. The war becomes visible in the form of barren lots, withered saplings or the death of a large, old tree.

This battle is precipitated when vegetation is removed and the fertile top soil replaced by barren subsoil. The ground is further destroyed by toxic gasses from car exhausts and leaky gas lines. Snow-removal salts and dogs staking out territorial boundaries complete the sterilization process.

These insults heaped upon the urban landscape often have a medium suitable only for the simplest forms of life such as algae and bacteria. Rather than wonder why our plants are not growing well in this urban landscape, we should be amazed that they are growing at all.

rooted in history

The early evolution of plants took place in water. The forerunners of our modern flowering plants were like algae, not divided into root and shoot systems. In fossils from over 425 million years ago (the Silurian age), paleobotanists find some of the earliest evidence of plants making the transition from an aquatic to a terrestrial existence.

Organisms assaulted those ancient shores for millions of years before some hit upon the winning combination. The conquest of land was made possible by the development of roots.

Botanists theorize that an aerial branch, instead of growing upright, turned downward to evolve into a root. Thus, a chain reaction was set in motion to increase specialization at opposite ends of the plant's existence.

Ever since those Silurian days, plants have been refining this critical balance between roots and shoots. The leafy stems adapted to trapping light energy and adjusted to atmospheric variables, the diffusely-branched roots became better suited to penetrating and "mining" nutrients from the soil.

In one sense, the leaves and roots of a plant have negotiated a contract. Water losses from above must be balanced by absorption from below. Nutrients taken from the soil must be converted to food by the leaves and some of this energy returned to the roots. Deficits at either end cannot be tolerated.

For all our technology, we must admit that no artificial system has been invented that can harvest the sun's energy more efficiently than plants.

The variety of plant life we see reflects the different ways in which plants manage their water requirements. The native habitats of many of our commonly used urban trees, sycamores, elms and silver maples, for example, are along streams. Such sites, with their high water tables and periodic disturbance by flooding, favor these shallow rooted species. Oaks and beeches, on the other hand, are more deeply rooted and grow on the drier upland sites.

These differences in habitat requirements have evolved over long periods of time and have some important practical implications. The closer the planting site approximates the one under which the species evolved, the lower the maintenance cost and the greater the chance for success. Unfortunately, differences in natural habitat requirements are all too frequently ignored in selecting plants for urban sites.

The long history of land plants has been the integration of two quite different ways of life. A tree is a continuous series of tissues: the shoot system synthesizes energy above ground and the root system uses energy below. A tree is a conduit for mineral cycling. As nutrients flow through the tissues, energy is fixed and stored; the tree provides food for itself and for many animals.

For all our technology, we must admit that no artificial system has been invented that can harvest the sun's energy more efficiently than plants. Today, and for the foreseeable future, our existence depends upon plants. It is time that we began to act as if we understood this fundamental fact of life.

the shapes of roots

Determining the shape of a root system is no small task. About the only way to do it is to cut a trench alongside the plant and carefully tease away the soil. While this very exacting excavation takes place, the course of the root is plotted on graph paper. Only a few scientists have undertaken such laborious assignments; consequently, we

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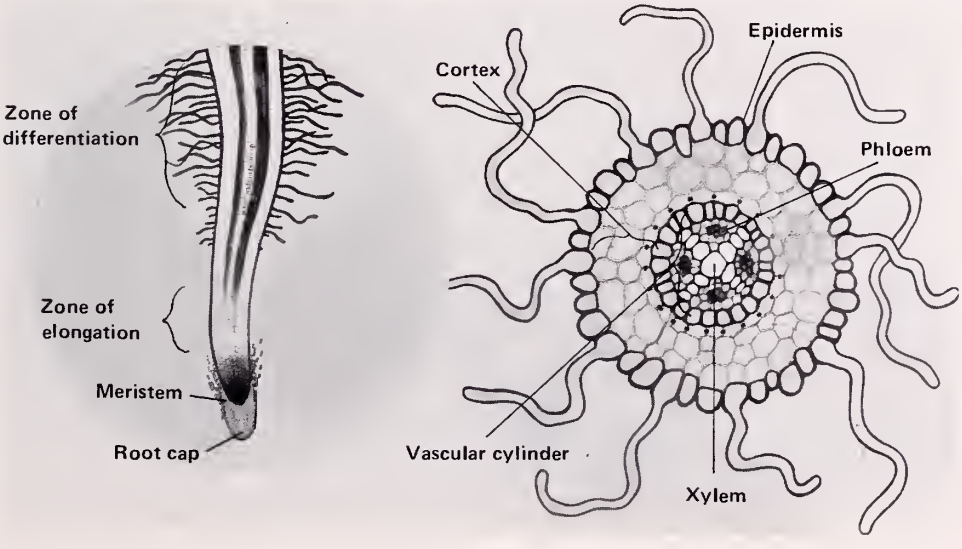
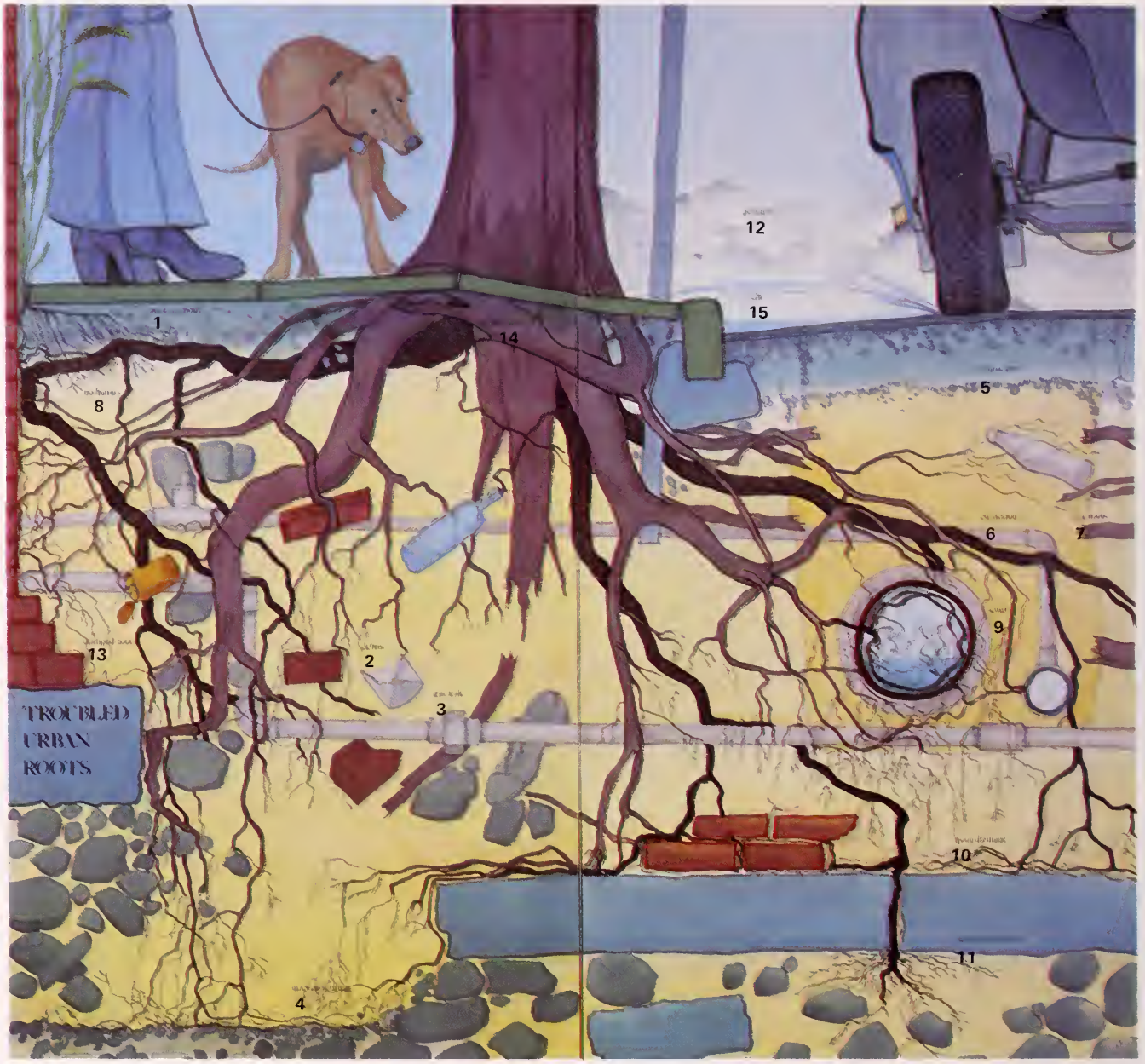


Illustrations by Andropogon Associates, Ecological Planners, architects and landscape architects of Philadelphia.



The death knell for thousands of city trees a year is caused by urban life's inhospitable environment. Given all factors, we may wonder how plants survive in the city at all.

1. poor aeration
2. debris
3. gas leak
4. uneven settling
5. compaction
6. excavation
7. cut roots
8. no humus
9. sewer
10. poor drainage
11. leaching concrete
12. pollution
13. cramped roots
14. girdling root
15. salt

don't know as much as we should about the structure of root systems.

The roots of some trees are thick and penetrate deeply into the soil. These are called taproots and represent underground extensions of the tree trunk. In some species, the taproot may grow to 14 feet deep while in others, it stops growing when the lateral roots are large enough to take over. The red oak *(Quercus borealis)* and the white oak *(Q. alba)*, which grow on upland situations are examples of species having taproots.

The Norway maple *(Acer platanoides)* in contrast, has wide-spreading lateral roots. Such root systems divide and subdivide to form a thick horizontal mat of roots concentrated near the surface of the soil.

The structure of the root system is programmed into the genetic makeup of the plant. What is unwritten in these instructions, however, is the environment that the root system will encounter: the depth to subsoil, the presence of an impervious layer of clay or lime, the proportions of sand, silt and clay.

All of these factors will have their influence. The shape of the root system will ultimately express both hereditary and environmental conditions.

The implications of root shape for urban plantings are obvious. The same consideration for space that is given to the canopy should be extended to the

roots; one should avoid using plants with shallow root systems near surface-level obstructions, for example.

This is borne out by a recent report on Norway maples from Poughkeepsie, New York. This common street tree was the culprit in 75 percent of the more than 1200 recorded instances of sidewalk heaving.

functions of roots

The functions of the roots are anchorage, absorption, transport and storage. Each process is highly integrated and must operate in a coordinated way to insure the proper growth and development of the plant.

Anchorage

The first obligation of the root is to anchor the seedling plant in the soil. The way the job is accommplished varies widely among plants, but it is a job that must be done with dispatch.

The flowering plants that include the roses and sunflowers (dicotyledons) and the conifers typically start out with a taproot. Lateral branches are added later as the root system matures.

In the other major group of flowering plants that includes the grasses and orchids (monocotyledons), lateral roots emerge early in the development up near the stem and a taproot does not develop.

The pattern of root development in the juvenile stages for any given species would be similar, indicating internal control. With age, however, the forms of the roots may vary widely, reflecting both inherent and environmental influences.

The rate and extent of the root development vary widely among plants. For example, a single rye plant growing in a container 12 in. square and 22 in. deep has been reported to produce 387 miles of roots in four months. That works out to a rate of 3.1 miles a day.

When we consider the forces of sun, wind and rain, which constantly batter the tops of trees, it is not surprising that a considerable investment of the plant's energy must be expended to keep the plant upright.

This investment is commonly unappreciated, however, in the course of excavation work when many roots of large, old trees are severed. Some time later, the tree falls for no apparent reason and people wonder why.

Absorption and Transportation

Most of the active absorption takes place at the very tips of the roots in a region only a few millimeters long. There the roots establish a close contact with the soil through several highly specialized tissue systems.

Leading the advance through the soil is the root cap. It is composed of several layers of cells that serve as a protective covering. The slippery consistency of the cells reduces friction.

Immediately behind the root cap is a thin layer of actively dividing cells, the meristematic region. New cells origi-

continued

As the leafy stem adapted better to trapping light energy and adjusting to atmospheric variables, the diffusely-branched roots became better suited to penetrating and "mining" nutrients from the soil.

nate here to add to the growing body of the root and replace cells that are eroded at the root cap. This expansion of the root system, especially during the active growing season, is essential to keep the root tips in constant touch with new reserves of minerals and water.

Behind the meristematic region, the cells enlarge and differentiate into the various tissue systems. Under a microscope, one can see a conducting system for water and minerals (the xylem) and another for transporting sugars (the phloem).

The surface of the root is covered by epidermal cells specialized to protect and absorb. Below the epidermal layer is the cortex surrounding the vascular cylinder and serving for storage and support.

The delicate root hairs that occur even further back, greatly add to the surface area and thereby increase its absorptive capacity.

Minerals make up only a small percentage of a plant's bulk (between two and ten percent) but are vital to its existence. Those needed in the greatest quantities are calcium, nitrogen, phosphorous, sulfur, potassium and magnesium. Those used in lesser amounts include iron, zinc, manganese, copper, boron and molybdenum. The zone immediately behind the meristem is where minerals are most actively up by the plant.

Soils differ widely in their nutrient content and, therefore, in their capacity to support plant growth. While plants may require the same elements, they differ considerably in the proportions they require. That is why repeated cropping with one species will tend to deplete certain elements and reduce productivity.

Water is taken into the plant both in the region behind the meristem and directly through the root hairs. These root hairs are in intimate contact with the soil. This relationship is frequently broken when transplanting.

Storage

Roots store food manufactured by the shoot system, as starch, in the cells of the cortex. Beets, carrots and turnips all have large reserves of these stored foods; and the storage capacity of many of these root crops has been greatly increased through artificial selection.

Natural selection in forests of northern regions also favors increased root mass. That is, northern trees tend to have greater root mass relative to the mass of stems and leaves than do trees from southern regions.

Tropical climates allow year-round growth and a greater proportion of the mass of a tropical forest is invested in stems and leaves. Large reserves of energy stored in roots are not needed.

The development of storage capacity in roots has considerable adaptive value.

A single rye plant growing in a container 12 in. square and 22 in. deep has been reported to produce 387 miles of roots in four months. That works out to a rate of 3.1 miles a day.

It varies widely among species and geographic regions and is under both genetic and environmental control. The depletion of these stored reserves through a succession of severe winters can result in the death of the plant and hardiness is therefore strongly correlated with storage capacity.

the incredible network

The large vaults of vegetable mass underground have attracted animals and plants that have established various relationships with the root systems. Some of these organisms help promote root growth while others are detrimental.

Bacteria of several strains form symbiotic relationships with many of the legumes and may account in part for the success of this large family. Nodules of bacteria produced on the roots convert gaseous nitrogen into a usable form of nitrates. This symbiotic relationship greatly enhances soil fertility.

Another symbiotic relationship exists between fungi and roots, mycorrhiza. The fungus enveloping the root greatly increases the surface area and thereby the capacity to absorb water and nutrients. Fungi can also inhabit older roots and extend the absorbing capacity over a much greater portion of the root system.

The inability of some plants to grow on certain sites may be due to the absence of a fungus that is needed for forming this mycorrhizal association. Such findings have important implications in the revegetation of disturbed urban areas.

A host of organisms inhabit the soil. They vary in size from relatively large mammals to the microscopic. Rodents, beetles, mites, worms, ants, algae, protozoa and bacteria are some of the major groups represented. They burrow, decompose, eat plants, eat each other and cooperate when it is mutually beneficial. An incredible network of plant and animal interrelationships exists in a healthy soil to stabilize it and make it suitable for plant growth.

All of us have grown things in our gardens without the knowledge of these complex factors and have had some success. But, just as often, we have had plants die for "unknown reasons."

We cannot treat plants properly without knowing their needs. Especially in cities, we must use all the knowledge and tools at our disposal. Through this greater understanding, perhaps we can begin to dig our way out of the crisis of our urban roots.

The Morris Arboretum's exhibit in the 1978 Philadelphia Flower Show, from which these graphics were adapted, was designed to give the public a more vivid impression of the underground world. It was offered in the hope that a better understanding of what goes on there might encourage successful urban gardening.

Partially funded by a grant from the Pennsylvania Horticultural Society, sections of this exhibit were designed to travel to give a wider public view of our urban roots. The exhibit can be seen at the PHS from September 11 through October 6.

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Marilyn Peterson is a free-lance writer who most recently contributed to the *Green Scene* in the July-August 1978 issue. As a volunteer at the Morris Arboretum, she works mainly with ferns and helps to interpret the Arboretum's activities to the community that it serves.

THE WINTER OF 76-77 To the Root of the Problem

The author explores the factor he considers most responsible for the extensive damage of ornamentals in the winter of '76-'77.

by James E. Cross

Much has already been written about the ornamental plant damage of the winter of 76-77.* Excellent reviews of the numerous factors bearing upon plant hardiness have been presented but few of these commentaries have given appropriate emphasis to that one single factor which, at least in the New York, Boston, Philadelphia area, was the underlying cause of most damage and fatalities to established plants—plants that had met apparently severe tests of other winters. That factor also provides a very logical explanation for many contradictory events—for example, plants of known hardiness that were damaged while some other plants, more tender, came through unharmed.

Understanding all of the functions of this factor is most important, for this factor is one of the very few over which gardeners can exercise some real control in order to avoid much of the damage experienced in '76-'77.

The factor is **water**—the water, or the lack of it, in the topsoil and in the subsoil going into the initial early December (1976) freeze—which freeze, in turn, lasted through much of the winter in the Northeast thereby preventing later snow melt or rain from making any significant difference in the soil water content that existed at winter's beginning.

Most gardeners of any experience already know, if only from having read it many times in fall gardening columns, that it is important to saturate soil with water to enable the plants to withstand winter. How many of us did anything about it before December 1 of 1976? We are all just a wee bit spoiled by the generally dependable and adequate watering job given most every year by Nature (witness the fall of '77 and early winter of '78 as an example in the extreme) so we were easily lulled into inaction when the exception finally came along. Those who did irrigate well before the first big freeze came out of the winter with no worse than average conditions.

In 1976 we, in the Northeast, left summer behind with an unusually low reserve of moisture in the subsoil. The early fall did not help and, most important, the regional rains of November '76 were nonexistent. On Long Island we had no significant rain at all in November '76 until the 29th when about ½ in. fell, an entirely inadequate amount even to begin to make up for the deficit. The temperature went below freezing on the 30th, to 16°F on December 1 and that was that for the remainder of winter.

Going into future winters, if there is any doubt about rains being adequate to bring the soil moisture up to full capacity, you should put down a good, full one inch of water to your garden just ahead of the likely time for the first real freeze.

The importance of a maximum amount of water in the soil goes far beyond the common problem of desiccation at the top of the plant (when it cannot bring up adequate moisture from the frozen-in roots to replace the moisture loss from sun and wind). Desiccation can occur in any winter even when the soil is saturated (e.g., witness the severe dessication of the 1978 winter). Moreover, the more persistent snow cover on lower plants should have lessened or eliminated this problem during the winter of '77, as it most certainly did for snow covered foliage in 1978.

water as a buffer

Soil water serves the plants as an extremely important "buffer" to cold temperatures. It plays the major part in determining which temperatures the root areas reach and the depth the full frost reaches. In most winters with even an apparent two feet of frost, a thermometer in the center of the root zone of a typical garden plant would read in the close vicinity of 32°F. Not so in 1977; because of the absence of this water "buffer," the soil temperatures plunged through the freezing level and must have reached at least into the mid-teens several times, depending upon the low air temperature in that particular area.

As growers of plants in containers above the ground have learned the hard way, plant roots do not acclimate for winter as the top parts do. Roots can be killed at temperatures that have absolutely no effect on the above-ground wood and foliage. Moreoever, a large number of popular plants' roots are killed at root temperatures somewhere between 15°F and 25°F. The group includes all of the ilex species, the native and exotic alike. It includes most, if not all, of plants in the Rosaceae family—such as commonly used cotoneaster and pyracantha. It includes many, if not all, of the fleshy rooted plants—such as *Cornus florida* and magnolia. It includes some species of buxus, daphne, euonymus, mahonia, leucothoe, viburnums, and many others in a list that is growing constantly as research on this subject continues.

continued

*Ed. Note: See Sept. 1977 *Green Scene* "Unusual Winter Tests Borerline Hardiness," G. E. Patton, p. 10.

photos by James E. Cross

Kalmia angustifolia — dessication above snow line (winter '77-'78, Long Island, N.Y.).

Rhododendron Sappho — dessication above snow line (winter '77-'78).

Unless you were specifically looking for it the tremendous root damage of the winter of '77 could not be seen directly but the effects were readily observable. When the first sap began to move upward in evergreen American, Japanese or English holly, you could see the old foliage drop off in the plant's apparent attempt to offset the loss of roots or the inadequacy of the remaining live roots to support this foliage. A Japanese holly that might have survived 15 years in a garden might logically have been expected to have been partially or entirely denuded of foliage. Given a healthy plant going into that winter, it would be logical to expect that the plant in the poorly drained location (with the soil containing more water) survived better than the one on the well-drained sandy knoll. An almost perfect example of the buffering effect of water on these root sensitive plants was seen here on the far eastern end of Long Island with two stands of the tough, native *Ilex glabra,* inkberry, of the exact same age and within 100 feet of each other. One planting showed nothing more than the typical winter inky splotches on the last growth whereas the other planting was defoliated to the last leaf. The former had been irrigated heavily in late November but the sprinkler never got to the latter in time to beat the freeze. The damaged planting apparently retained some live roots because we were busy and did not pull it out and, in July, it began to send out new growth after the root structure had time to partially restore itself.

We know generally why water buffers cold but, perhaps, if we examine the extent of its ability to do so, we would better understand the critical importance of this ingredient to winter survival in our gardens. Before it can freeze completely (with the temperature actually going through 32°F), water must give off a tremendous amount of heat and this heat goes into the soil around your plants. By definition, one gram of water releases one calorie in dropping 1° centigrade in temperature but, in the process of breaking through the freezing point, one gram of water gives off 82 calories.* A typical bucket of water would have, at the freezing point, a buffering capacity of 781,000 calories! This heat, given off as the soil water turns to ice, serves to keep the soil around the roots above the root-killing temperatures mentioned earlier. Winter damage from destroyed roots is thus avoided by the mere presence of adequate soil moisture. The more water the soil contains, the longer the temperature in the vicinity of the roots will be prevented from dropping below freezing.

another kind of damage

There was another kind of plant damage that does not have to do with root kill nor does it appear to meet the usual definitions of dessication of the foliage or wood. Whatever it is, it does not appear to be easily or logically explained by simple observation. Examples of this classification of damage abounded following the winter of '76-'77—including the death of a 20- to 25-year-old rhododendron 'Roseum Elegans' (whose roots are known to withstand very low temperature) located

*For a fuller explanation of this principle check a physics textbook under "latent heat of fusion."

near the peak of a bank covered with typical Long Island sandy soil—and including two tough, established Norway spruces within 5 ft. of each other but one irrigated and protected from the north and west by a wall, the other in dry soil and fully exposed. The dry plant did not break any new growth until late July, whereas the irrigated plant developed normally. For want of a better description the characteristics of this type of damage seem to match up with "freeze-dried." Here too, there were visible indications that the presence of more adequate soil moisture made the difference, but not because of root killing temperatures.

In a winter like that of 1976-77, there are bound to be many examples of damage that do not seem to fall neatly into line with these comments, but, one thing is certain, soil moisture was a major factor in the presence or absence of damage and is something over which we gardeners can exercise some control.

Going into future winters, if there is any doubt about rains being adequate to bring the soil moisture up to full capacity, you should put down a good, full one inch of water to your garden just ahead of the likely time for the first real freeze or if you sense that the fall, particularly November, has been unusually low in rainfall, as it was in 1976, repeat this one inch of irrigation two or three times at intervals of two days or more.

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James E. Cross is the owner and manager of Environmentals, an eastern Long Island wholesale nursery growing a wide variety of woody ornamentals in containers.

Damage to Ornamentals during Winter of 1977-78

After we received the author's manuscript about the winter of '77, we wrote asking if he had any comparisons or observations with the winter just past. Here's what he wrote:

"Many garden plants with evergreen foliage showed desiccated (burned or dried up) foliage especially on the southeast side on that part of the plant that extended just above the snow line during those many bright, sunny days of subfreezing temperatures that followed the big snow. The damage was particularly evident on the foliage of the taller, broadleaved evergreens such as rhododendron, holly, leucothoe and pieris (Japanese andromeda).

"This damage from desiccation to broadleaved evergreens is more widespread than in the previous winter of 1976-77, even though that winter was in most respects more severe from the plant's point of view. This year's damage was concentrated in the upper plant parts. There should be noticeably fewer complete fatalities of ornamental plants than was the case following the 1976-77 winter with its very dry soil, deep frost and considerable root kill.

"This past winter's pattern was most unusual for Long Island and an examination of what took place since the first heavy snow on January 20 provides some understanding of how this widespread foliage damage occurred. The first heavy snow of the winter disappeared with that heavy flush of rain in late January leaving the ground bare for the next 10 subfreezing days. With the ground saturated with water, the frost did not go deep in most places but it was sufficient to freeze past the root depths of the more shallow rooted broafleaf evergreen plants, leaving them without full capacity to take up moisture to replace that moisture lost through the foliage. The big snow came on February 6 and thereafter about a month of mostly very sunny days with temperatures remaining below freezing. As the snow slowly settled and evaporated, more and more evergreen foliage became exposed to the sun's radiant warmth accentuated by reflection of the packed snow. In the first part of the day when the temperature and humidity were the lowest, the direct sun warmed the rhododendron or holly's leaves to the point of very rapid transpiration of moisture—too rapid to be placed, leaving behind a dried and damaged leaf, and in the locations of maximum sun exposure, damage to the woody stems or branches as well.

"The first step to help the damaged plants to recover was to make a close, careful examination to ascertain the extent of the damage. If the damage was confined to the leaves and the woody stems were still supple and showed green wood, nothing need be done. As spring progressed, the undamaged leaf buds broke into growth and replaced the old foliage. If the plant put out a heavy load of spring flowers, the recovery process could have been speeded by thinning out or removing entirely the flowers on the flower buds before they opened.

"If your examination of the plant revealed that the woody branches were also desiccated—brown and brittle—it would have sped recovery to cut back until you found good green wood.

"There are one or two measures that might be taken to help prevent this desiccation damage should we have a similar situation in some future winter. Medium to heavy shade to moderate exposure to the warming sun from the southeast, south and southwest would make a considerable difference where it is practical. An annual mulching (of 1 to 3 in.) of your broadleaf evergreens will probably prevent the frost from shutting down the entire root system of these plants thereby enabling them to replace the moisture lost to the warm sun before the leaves were damaged. An annual fall mulching must, however, be done at the right time or you can do more harm than good. The ideal is to put the new mulch in place after a real hard frost or two (by which time the plants will have hardened to winter) but before the ground has frozen up. One way to measure the best time for applying mulch would be when your garden's soil temperature reaches somewhere in the vicinity of 40°F."

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Wildflowers in Philadelphia

by Zandra Moberg

The animals who have adapted to living closely with men in cities are not at all the same creatures who inhabit natural areas. Rats, roaches, domestic cats and dogs, starlings and pigeons—they are all fairly specific to the urban scene, and in that sense do not seem to be part of nature. The wild animals of forest and meadow cannot easily share our man-made environment.

Wild plants, however, make no such broad demands on their habitat. The green stalk victoriously protruding from a crack in the sidewalk, the leafy weeds at the edge of a parking lot, the jungle of greenery that appears on every vacant lot, are not separate species of lowly city weeds. They are mostly wildflowers—the same ones that grow along picturesque country roads and in rural meadows. Indomitably, they grow and multiply in every tiny bit of space that is not covered by concrete and asphalt, and sometimes even there.

When I moved to West Philadelphia a few years ago I regretfully put aside my wildflower guide, resigned to giving up my new-found interest in identifying wildflowers. There were plants all around, but it did not occur to me that they were anything but "city weeds." One hot July day I happened to spot, at the edge of a dusty University of Pennsylvania parking lot, what looked like Jimson weed (it turned out to be hedge bindweed). I resurrected the wildflower guide and returned to the spot to find night-flowering catchfly, Asiatic dayflower, galinsoga, yellow sweet clover, white sweet clover, wild carrot, spiny-leaved sow thistle—the list went on to include sixteen species in one barren-looking parking lot.

Since that revelation I have tried to carry Roger Tory Peterson's *Field Guide to Wildflowers* (excellent for beginners) with me everywhere, and found that every city walk can be a botanical adventure if one has the time. While it is true that within city limits the wildflower enthusiast is not likely to find painted trillium or dwarf ginseng, the variety is gratifyingly great. It seems that almost any wildflower whose habitat is cited in Peterson as "roadsides," "open places," or "waste ground" can miraculously find its way into the city and take hold. One of the commonest varieties, fleabane, is even named for our city, *Erigeron philadelphicus*.

My forays have been mostly in the densely urban Center City and near West Philadelphia areas, where I can aver that the following abound, in addition to those already mentioned: bladder campion, lamb's quarters, prickly lettuce, alfalfa, peppergrass, tansy, horse nettle, evening primrose, violets, smartweed, clover, yarrow, nightshade, sorrel, phlox, bluet, milkweed, goldenrod—an incomplete list, only suggestive of the variety. Some are widespread, and some, like flower-of-an-hour, I have found only once.

During the summer of 1975 the construction program of Drexel University required bulldozing a large piece of ground at 33rd and Lancaster Avenue. Almost immediately the upturned soil was covered by a plethora of wildflowers. One of them became an exciting find. I had noticed on my way to work one morning, among the grasses and familiar flowers at the construction site, a patch of yellow flowers with scarlet-purple centers, beautiful and quite new to me. I decided to pick one that afternoon to identify it. But when I came back later I could not find a single one of the yellow and red blossoms.

But the next morning, there they were again, brightly blooming in the

same place. I memorized the exact spot, and resolved not to miss them this time on my way home. And again, by late afternoon they were all gone. Mystified, I picked a few of the leaves and hurried home to my *Field Guide*. Leafing through Peterson's illustrations, idly twisting the coarsely toothed leaves in my fingers, I came upon the picture. There it was—flower-of-an-hour, a member of the mallow family, "which quickly wilts!" That was quite a discovery, as I had never come upon anything like that, even in the country.

Wildflower identification is not, of course, always that simple and is fraught with the danger of being controversial or incorrect. On a nature walk in the Poconos I was extolling city plant hunting and happened to mention hop-clover as a Philadelphia find. East Stroudsburg College botanist Frank Buser told me that he seriously doubted that it was hop-clover I had found, but rather black medick, which it closely resembles. Although hop-clover is listed in at least one book as a city-dweller, I had apparently fallen into a common botanical trap. I sent Dr. Buser a sample of the Philadelphia hop-clover look-alike, just to make sure. [Note: a year later this issue is still not resolved; as a matter of fact more people have entered the discussion.]

If one is willing to concede that Philadelphia's parks (Philadelphia has one of the largest urban park systems in the world) are part of the city, the possibilities for finding a wide variety of plants are multiplied. Sections of Fairmount Park support wild plants whose habitats are listed in Peterson as "woodlands" and several kinds of wet places. Mandrake and jack-in-the-pulpit growing in Morris Park in Overbrook are in this category.

Nettles, which grow thickly in some parts of the park system, are a leafy green unique as a source of protein—a pound of nettles contains 31 grams.

City and park habitats are promising hunting grounds, too, for enthusiasts of medicinal herbs and edible wild plants, both growing in popular interest. Medicines and herbal teas on the shelves of health food stores are usually described as having been picked in some far-off wild place or imported from Europe. Undoubtedly many of those are the product of flowering plants that grow wild in the city. Commercial chamomile buds, for example, are imported from West Germany. Wild chamomile is also available, admittedly in small quantities, a stone's throw from the Philadelphia Museum of Art by the banks of the Schuylkill.

Wildflowers of the city can even be, if one chooses, a source of essential nutrients. Nettles, which grow thickly in some parts of the park system, are a leafy green unique as a source of protein —a pound of nettles contains 31 grams! Violets, also fairly widespread, are incredibly high in vitamin C. Lamb's quarters and purslane, both sources of several vitamins and minerals and eaten by many, are ubiquitous. I once found enough of the latter in a large concrete tree container at 16th and Walnut to make a salad. The tree was unfortunately dying, but the purslane was thriving.

The opportunities for discovery seem endless. I have just begun to learn about plants, and I have merely scratched the surface of Philadelphia's wildflower offerings. They are worthy of our notice.

These wild plants growing around us are vivid, cheerful tributes to the invincibility of life despite man's environmental folly, an awesome gift.

continued

Drawings by Léonie Hagerty Bell from *Weeds of Lawn and Garden* by John M. Fogg, Jr. (University of Pennsylvania Press, 1946).

Some wildflowers collected in Philadelphia city limits.

Achillea millefolium, yarrow
Amaranthus hybridus, pigweed
Arisaema triphyllum, jack-in-the-pulpit
Asclepias syriaca, milkweed
Chenopodium album, lamb's quarters
Chenopodium ambrosioides, Mexican tea
Cichorium intybus, chicory
Commelina communis, Asiatic dayflower
Convolvulus sepium, hedge bindweed
Daucus carota, Queen Anne's lace
Erigeron philadelphicus, Philadelphia fleabane
Galinsoga ciliata, galinsoga
Glechoma hederacea, gill-over-the-ground
Hibiscus trionum, flower-of-an-hour
Houstonia caerulea, bluet
Lactuca scariola, prickly lettuce
Lepidium virginicum, peppergrass
Matricaria chamomilla, chamomile
Medicago lupulina, black medick
Medicago sativa, alfalfa
Melilotus alba, white sweet clover
Melilotus officinalis, yellow sweet clover
Oenothera biennis, evening primrose
Oxalis europaea, wood sorrel, sour grass
Phlox paniculata, phlox
Podophyllum peltatum, mandrake
Polygonum pensylvanicum, smartweed
Portulaca oleracea, purslane
Silene cucubalus, bladder campion
Silene noctiflora, night-flowering catchfly
Solanum carolinense, horse-nettle
Solanum dulcamara, nightshade
Solidago rugosa, goldenrod
Sonchus asper, spiny-leaved sow thistle
Tanacetum vulgare, tansy
Tradescantia virginiana, spiderwort
Trifolium pratense, red clover
Trifolium procumbens, hop-clover (?)
Urtica dioica, nettle
Viola papilionacea, violet

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West Philadelphian Zandra Moberg walks to work at the Library of the College of Physicians (near 22nd & Chestnut) every day, which affords many tempting opportunities to examine Philadelphia wildflowers along the way. She is a graduate student in Library Science at Drexel University.

a kettle of nettle

A valuable "undiscovered" plant is the common stinging nettle, *Urtica dioica.* We know it well, of course, as a pestiferous perennial weed with spiny leaf hairs that cause a painful smarting and rash. But it's also a good fertilizer, a plant protector, and a delicious and nutritious food.

In Europe, where this nettle is native, gardeners use it as a compost activator, adding chopped nettles generously to their compost heaps. The foliage has a higher protein content than any other leafy material, and so supplies a great deal of nitrogen for decomposition bacteria. Nettles are also good as a mulch, and a rich liquid fertilizer is made by soaking nettles in water for two or three weeks (do this in a cool place or it may ferment and develop a strong odor). A solution made by boiling fresh or dried nettles is effective against plant lice, aphids and mildew, says Audrey Wynne Hatfield in *How to Enjoy Your Weeds* (Sterling Publishing Co., 1971).

The stinging nettle is rich in not only protein but also in vitamins A and C, phosphorus, calcium and iron. The young top leaves gathered in early spring (wear workgloves), washed and steamed for 10 minutes, are a delectable potherb alone or combined with dandelions. Cooking destroys the formic acid which is the main component of the nettle's "venom." These leaves can be frozen or dried for later use. Nettle tea, beer and wine are European favorites, worth making even if you don't believe in the medicinal values ascribed to them. Dried and crumbled nettles are often sprinkled on salads or over potatoes and even used in pancakes.

Nettle soup is probably the best known use. Wash and boil the young leaves and put them through a strainer. Add melted butter, a little flour, and sufficient cream or milk to give the desired thickness. Simmer for five minutes. Some chefs add celery and onions.

Euell Gibbons' *Stalking the Healthful Herbs* (McKay, $6.95, $2.95) has many other interesting recipes for nettles.

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Reprinted courtesy of *The Avant Gardener*

Carex morrowi 'Variegata' in August at Brookside Gardens, Wheaton, Md.

A Greenhorn Discovers Ornamental Grasses

by Karla Patterson

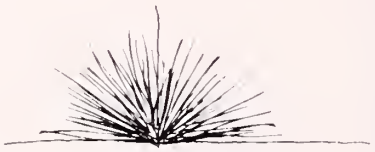
Several years ago I first heard about the grasses, but it wasn't until recently that they became a prominent group in my limited repertoire. Several conversations and some concentrated studying later, I was hooked. Clumps of maiden grass *(Miscanthus sinensis)* began to sway in the breeze where some unknown mass had recently stood. A striped, ribbon-like ground cover I had seen in Wilmington turned out to be gardener's garters *(Phalaris arundinacea* 'Picta') and every time I turned around I was running into or over plantings of blue fescue *(Festuca ovina* 'Glauca').

I have found that the process of learning about plants is not a solitary experience, but one that is nurtured by human interaction peppered with plenty of enthusiasm. One such experience was visiting a wholesale nursery in Maryland, where the owner, an established horticulturist, has a soft spot for ornamental grasses. Eight hours and 40 species later, I had a new appreciation for numerous grassy forms, from tiny "pin cushions" to oceans of undulating flowers and foliage.

What is it that turned me on to grasses? Their simplicity. They make a

continued

drawings by author



Tufted
(Festuca ovina 'Glauca,' Blue Fescue)

Irregular
(Phalaris arundinacea 'Picta,' Gardener's Garters)

clean, natural statement. They have a simple elegance. Grasses can blend into a flower border, serve as a foundation planting or be the center of attention in a landscape. In water or rock gardens, as a screen from unpleasant surroundings, or as a transition from formality to informality, their wide variety of habits, colors, and seasonal interest lends them to a number of uses in the garden. (Not to mention their use indoors—that dried arrangement I had been returning to in the florist's window was made up of grass flowers.)

Ornamental grasses include true grasses of Gramineae and a number of plants from neighboring families such as irises, sedges, and lilies, that have grass-like characteristics. Also, the grasses about which I speak are not to be confused with turf grasses,the kinds that have to be cut every Saturday morning. Ornamental grasses generally fall into several categories according to their growing habits. These are: tufted, irregular, upright-narrow, upright-open, upright-arching, mounded, and open spreading (see drawings). In choosing plants for your landscape consider their height, form, and seasonal variation, along with their flowers and foliage. Some grasses, especially annual types, flower in the early summer; others flower in the fall and some hold their flowers and foliage through the winter creating interesting sculpture under the snow or ice. Most grasses are in the green-beige color range, but some reach out to include blue, purple and shades of orange and pink.

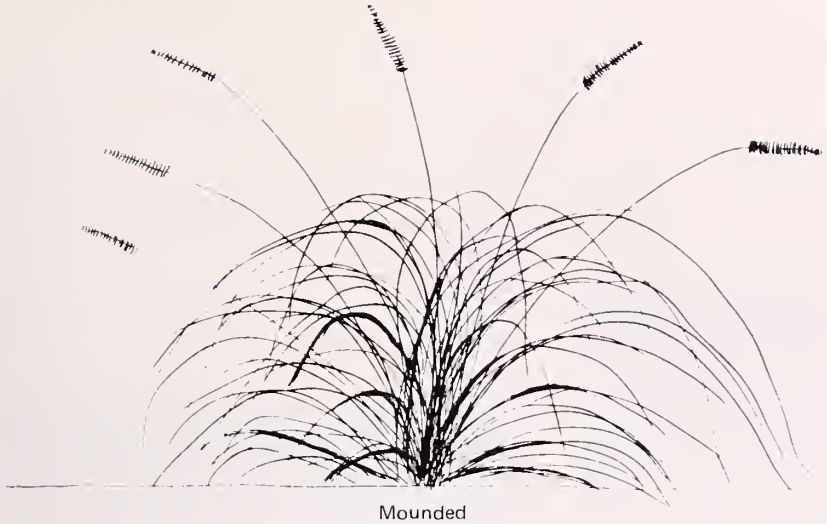
Although one of the best ways to learn plants is to grow them, apartment life inhibits my outdoor gardening. So I've gone the next best route; I've talked with those who have grown a number of grasses, observed their gardens and read what little information I could get my hands on.* Different species have their own preferences related to their origin and nativity, but in general, grasses favor well-drained soil in sunny locations. They frequently fall over if grown in the shade. Annual grasses can be spaced 6-12 in. apart and

*I recommend *Ornamental Grasses* by Mary Hockenberry Meyer, Charles Scribner's Sons, New York, 1975.

Upright - open
(Miscanthus sinensis)

Upright - arching
(Erianthus ravennae)

Open - spreading
(Eragrostis trichodes)



Mounded
(Pennisetum alopecuroides)
w/flowers

Upright - narrow
(Calamagrostis epigeios hortorum)
w/flowers

will require periodic weeding, replacement, and dead-heading (pick the flowers for drying or fresh arrangements).

Perennial grasses are usually purchased as year-old plants and grow to maturity in two years. They should be planted with a rootball in early spring, with spacing equal to the mature height. Perennials die back each year and the old plants should be cut back to 6 in. stems in the late winter as the new shoots will come up from the crown. Healthy, well-groomed plants will need dividing about every five years. Do that in the spring, after the new shoots are up. Some of the grasses might require staking, depending on their location and landscape use.

When looking at a new plant group it's easy to see only merits and overlook their faults. Grasses are basically pest-free, but occasionally suffer from fungal leaf spots. The degree to which that is a problem depends on what you can tolerate. Choosing the right location is a must not only aesthetically, but culturally. As I said, they are sun bathers. Some grasses can get out of hand, their rhizomatous roots virtually going wild in loose soil, so you end up with an entire front yard full of phalaris. You can control it and other spreading grasses by sinking a metal liner into the ground around the base of the plant. A final and very vexing problem is locating grasses in the trade. Nurseries might carry two or three common types, but it will be difficult to find some of the rarer ones. All I can say is be persistent. (See source list.)

I've had to be careful with this new interest. Aside from being consuming, it can be dangerous. Once I learn a new plant group I tend to see them all over and to look for them everywhere. I'm seeing old and new grasses all the time, recognizing their relatives in gardens, store windows and along Route 95. In fact, I practically ran off the interstate trying to catch a glimpse of shimmering reed grass in my rear view mirror. That's *Phragmites communis.* Those binomials are getting easier and easier.

My Ten Favorite Grasses (so far)

NAME	HABIT	HEIGHT	ZONE	COLOR	BEST SEASON	FLOW.	FOL.
Andropogon scoparius Little Bluestem	upright open	1½-5'	4	gr, rd, purp	summer, fall, winter	x	x
Arundo donax Giant Reed	up-open	7-20'	7-8	bl, gr	summer, fall		x
Calamagrostis epigeios hortorum Reed Grass	up-open	3-6'	5	gr	summer, fall	x	x
Carex morrowi 'Variegata' Japanese Sedge Grass	low mound	6-12''	6	yel-gr w/wht stripes	spring, summer		x
Helictotrichon sempervirens Blue Oat Grass	tufted	2-3'	5	blue	summer, fall		x
Hystrix patula Bottlebrush Grass	up-open	2-4'	5	gr	summer, fall	x	
Miscanthus sinensis 'Zebrinus' Zebra Grass	up-narrow	4-7'	5	gr w/horizontal yel bands	spring, summer, fall		x
Pennisetum alopecuroides Fountain Grass	mound	4'	5	gr	summer, fall	x	x
Phalaris arundinacea 'Picta' Gardener's Garters	irreg	2-4'	4	wht, pk, gr striped	spring, summer, fall		x
Uniola latifolia Northern Sea Oats	up-arch	3-5'	5	gr-tan	summer, fall	x	x

All of these grasses are perennial.

Karla Patterson, originally from Illinois, received her B.S. in horticulture from the University of Kentucky and graduated with a master's degree from the Longwood Program in Ornamental Horticulture at the University of Delaware this past May. She is planning to pursue a career as an educator in a botanical garden or arboretum.

Pennisetum alopecuroides

Arundo donax

photos by Karla Patterson

Calamagrostis epigeios hortorum

SOURCE LIST

Retail Nurseries

Palette Gardens
26 West Zion Hill Rd.
Quaktertown, PA 18951

McNicols Landscaping
R.D. 1, Box 33
Nassau Commons
Lewes, DE 19959

Martin Viette Nurseries
Rt. 25A
East Norwich, NY 11732
(doesn't ship)

Carrol Gardens
P.O. Box 310
444 East Main St.
Westminster, MD 21157

Weston Nurseries
East Main St.
Rt. 135
Hopkinton, MA 01748

Retail Seedsmen

George W. Park Seed Co., Inc.
Greenwood, SC 29647

Stokes Seeds, Inc.
Box 548
Buffalo, NY 14240

Thompson and Morgan, Ltd.
P.O. Box 24
401 Kennedy Blvd.
Somerdale, NJ 08083

Wholesale Nurseries

Bluemount Nurseries, Inc.
2103 Blue Mount Rd.
Monkton, MD 21111

Kurt Bluemel, Inc.
2543 Hess Rd.
Fallston, MD 21047

Monrovia Nursery Co.
P.O. Box Q
18331 East Foothill Blvd.
Azusa, CA 91702

SUGGESTIONS FOR ENERGY CONSERVATION IN HOME GREENHOUSES

by Jane Pepper

Several years ago a representative from the Philadelphia Electric Company called my husband in early spring. According to him the conversation went something like this:

Philadelphia Electric: "I've been checking the statements for the first three months of this year and find your bill is almost double what it was last year. There must be some mistake but we can't figure out where the problem is."

Pepper: "Unfortunately the mistake is ours, not yours—we built a greenhouse."

When I consider the joy we get from the greenhouse I would not exactly call our action a mistake. It is, however, an expensive addition to our electric bill, and after two hard winters I am sure many hobby greenhouse owners share my anxieties about future fuel costs. Other gardeners will have considered building a greenhouse but may have held off because of the energy situation. It's not simply the cost: when I criticize corporations for leaving their lights burning throughout the night in empty buildings, I have to reflect that I am not exactly beyond reproach in the amount of energy I waste in the greenhouse.

Having co-edited *Energy Conservation in Greenhouses* (1), a summary of many of the articles published in various journals to help commercial greenhouse operators save fuel, I decided to see how home greenhouse owners were tackling the problem. Many of the energy conservation measures used in commercial greenhouses are applicable to hobby greenhouses, but for most of us the question of whether these measures will pay off depends on our doing them ourselves. You may be able to recoup the cost of insulating materials within a couple of years, but it will take a long time to recoup costs if you have to hire outside labor. However, if you are like me—far from accomplished with hammer, drill and other tools, take heart. There are some things even we can do to save energy. For the handy homeowner there are several possibilities to try in your greenhouse.

planning

First, however, some advice for those who are in a position to avoid some of the mistakes made by the rest of us who built greenhouses when fuel was relatively cheap and plentiful. When building a new greenhouse your biggest savings can be realized by careful planning.

Your first consideration should be site location. To obtain maximum exposure during "short" winter days when the sun is lowest in the sky, the building site should have an open southern exposure. Avoid building in frost pockets, or near buildings and evergreen trees that will shade the greenhouse. Deciduous trees are an asset since they shade the greenhouse in summer. If possible select a site that is protected from the cold north and west winter winds. If this is not possible create a windbreak. Plants are more durable than man-made objects such as walls or fences and, in addition, their flexibility is more effective in reducing wind velocity. Solid structures tend to create turbulence on their leeward sides. A single row of evergreens, located 40 to 60 ft. to the windward side of the greenhouse will help. More effective would be two or three rows, spaced 14 to 16 ft. apart. Windbreaks of course can be equally useful near an established greenhouse.

When considering energy conservation the arguments in favor of a lean-to greenhouse outweigh those in favor of a free-standing model. Some owners of lean-to greenhouses have even been able to take advantage of the excess heat available in a greenhouse on sunny winter days by forcing it into the adjoining house by means of a small fan. In most greenhouses this heat escapes into the great outdoors when the vents are opened.

The pros and cons of different glazing materials must also be considered. A number of companies are now producing double-walled plastic materials but most are expensive when compared to single-paned glass. One such material, Tuffak-Twinwall®, made by Rohm and Haas Company, Philadelphia, is provided as an optional glazing material for a line of home greenhouses made by Four Seasons Greenhouses (4). Another double-walled plastic is Acrylite S.D.P. supplied by CY/RO Industries, Wayne, N.J. Greenhouses made by Vegetable Factory Greenhouses (8) are glazed with a double-walled fiberglass.

costs

If you are planning a greenhouse you will undoubtedly be wondering how much this structure will add to your fuel bills. Since the costs for most home greenhouses are included in the main house heating bill such figures are hard to obtain. In our case, however, we had a unique chance to isolate the cost of heating our 9 x 13 ft. Janco (5) aluminum, lean-to greenhouse since the electric heater broke down at the end of January, 1978. As we closed the greenhouse during February and March we were able to compare our electric bills with those of last year when the heater was in operation throughout February and March maintaining a night temperature of 45-50°F. During February and March, 1978, our electric bill was $64.00 below that for the previous year. By assuming $32.00 to be the maximum monthly cost I

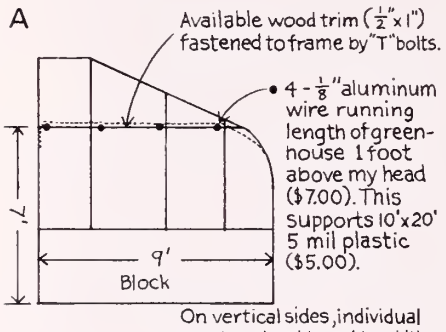
continued

estimate that it costs us $200 per annum to heat the greenhouse. (See box.)

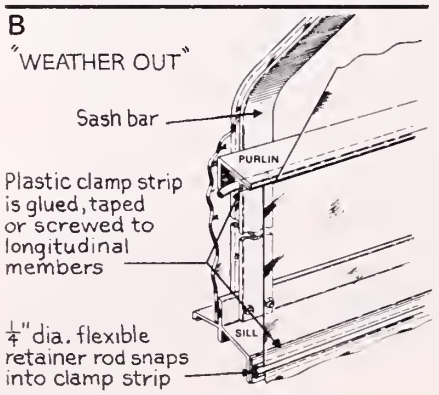
Mr. and Mrs. Robert Burns of Media who heat an 8 x 14 ft. lean-to Vegetable Factory Greenhouse (double-walled fiberglass glazing) with a Titan electric heater estimate it costs $1.00 per day to heat the greenhouse during the coldest months of the year.

Mr. and Mrs. Pierre LeBoutillier of Wayne, Pa., estimate that it cost them $200 to heat their greenhouse during January through April, 1978. The greenhouse is a 10 x 20 ft. Lord and Burnham (6) lean-to, heated by two 4000 watt electric heaters. In order to save fuel they suspended a clear plastic sheet on wires inside the greenhouse (see diagram A). This sheet reduced the area to be heated and also created a dead air space between the glass and the heated area which acts as an excellent insulation barrier. One of the problems with this system, however, is that since the LeBoutilliers were unable to grow plants in hanging pots the sheet reduced their growing space. This fall they have more ambitious plans—an extra layer of glass on top of the existing panes to create a more efficient dead air space.

With a wooden greenhouse the task of installing a plastic sheet is relatively simple because you can tack the plastic



10'x20' Lord & Burnham Imperial total $17.00



to the wood members. In an aluminum greenhouse you can use the LeBoutilliers' system or bolt wood strips to the aluminum frame. Another possibility is to use the "Weather Out" system, which includes plastic clamp strips and solid flexible retainer rods to hold polyfilm to the inside of the greenhouse (see diagram B). Further information on this system is available from Aluminum Greenhouses, Inc. (2). Burpee Seed Company (3) offers an optional greenhouse insulation kit including 4 ml polyethylene and attachment clips that can be installed in their line of home greenhouses. If you are interested in obtaining information on enclosing the exterior of your greenhouse in a double-layer of plastic write for Special Circular 101 "Conserving Heat in Glass Greenhouses with Surface Mounted Air-Inflated Plastic" from Ohio Agricultural Research and Development Center (7).

heat loss

Because the north wall of a greenhouse is a site for significant heat loss during mid-winter, commercial growers are replacing translucent north walls with solid insulated walls. Tom Lanahan of Way's Greenhouses, commercial rose growers in Kennett Square, has replaced the glass on his north walls with exterior siding, 2 in.-thick styrofoam and a layer of reflective aluminum building paper towards the inside of the greenhouse. No decrease in quality in Way's light-sensitive rose crop followed this installation. A hobby greenhouse owner, Nevin Kressley of West Chester, purchased 2 in.-thick styrofoam, carefully measured the area between his sash bars and cut the insulation with a saber saw to fit snugly between the sash bars. Kressley can remove the styrofoam during the summer but finds it simpler to leave it in place. In addition, he glued styrofoam to the inside of his 30 in.-high foundation wall with a tar preparation.

As you will recognize, the above projects, although not complicated, are sufficient to daunt those of us who are not accustomed to wielding a saber saw. What should we do to keep the heat in? First check the condition of the weather-stripping on your doors and vents. If it's in poor condition it is a relatively easy thing to replace. Next, consider installing Aircap, the non-handy person's answer to energy conservation in greenhouses. Aircap is a polyethylene material, one side of which is expanded with air bubbles. You have probably seen it used as a packaging material. Available in various sized rolls, some garden centers now sell it by the linear foot so you can purchase just enough to insulate your greenhouse. The manufacturers indicate that you can attach Aircap by spraying the inside of the glass with water and pressing the polyethylene onto the glass. In my experience this method is unsatisfactory, and last winter I tried a spray fixative. That, too, was unsatisfactory because the Aircap fell off in early spring and I have yet to find an effective solvent to remove the remaining fixative. Tom Lanahan recommends white glue diluted at a rate of 50:1 with water; Ralph Collins propylene glycol and water, 2:1 *(American Orchid Society Bulletin,* Volume 47, Number 2, February 1978, pp. 100-101). Paul Reber, Associate County Agent in Montgomery County, successfully used a material I plan to try this fall—double-sided adhesive tape.

As a one-time expert at Aircap installation let me give you a few tips. Prepare to get frustrated—it's an exasperating job. In addition to the Aircap and some form of adhesive you will need scissors, tape measure, Xacto knife to squeeze in small corners, and a step ladder. If you plan to use double-sided adhesive tape, do the job before the cold weather sets in so condensate will not cause attachment problems on the aluminum frame. Finally, one side of the Aircap is flat, the other bubbly. Stick the bubbly side to the glass, rather than following my example of initially sticking the flat side to the glass and thus defeating the purpose of the material. Due to ultra-violet deterioration Aircap will probably only last through two winters.

One of the easiest energy saving strategies that requires neither capital investment nor expertise with saber saw nor fixatives is to lower the temperature in your greenhouse. There are lots of marvelous plants that enjoy a night temperature between 45-50°F — but that's another story.

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Jane Pepper graduated from Longwood Program in Ornamental Horticulture at the University of Delaware in June 1978. At present she is contributing editor to *Plants Alive* and secretary to the Haverford College Arboretum Association.

photos supplied by author

Nevin Kressley's greenhouse with styrofoam.

Aircap on author's greenhouse

Estimated cost to heat Pepper greenhouse

December, January, February, March	— 4 months @	100%	$128.00
April	— 1 month @	50%	16.00
May	— 1 month @	25%	8.00
June through August			—
September	— 1 month @	25%	8.00
October	— 1 month @	50%	16.00
November	— 1 month @	75%	24.00
		TOTAL	$200.00

References

(1) *Energy Conservation in Greenhouses.* Edited by Philip G. Correll and Jane G. Pepper (1977), is available from the Longwood Program, University of Delaware, Newark, DE 19711 ($3.75).

(2) Aluminum Greenhouses, Inc., 14605 Lorain Avenue, Cleveland, OH 44111

(3) Burpee Seed Co., Warminster, PA 18974

(4) Four Seasons Greenhouses Co., 17 Avenue of the Americas, New York, NY 10013

(5) Janco Greenhouses, J. A. Nearing Co., 9390 Davis Avenue, Laurel, MD 20810

(6) Lord and Burnham, Irvington, NY 10533

(7) Ohio Agricultural Research and Development Center, Wooster, OH 44691

(8) Vegetable Factory Greenhouses, 100 Court St., Copiague, NY 11726

PLAYING HOST TO BUTTERFLIES

by Bebe Miles

No matter how beautiful, a garden without movement lacks something. Granted the errant breeze stirs the foliage and sets the flowers dancing to delight the eye. But somehow the graceful gliding about of butterflies adds joy to the heart of the beholder.

Some gardens have many more butterflies than others. One reason is definitely the kinds of flowers present. The larvae of these beautiful insects do not often occur in large infestations, so you need have no qualms about attracting the adults. No one can watch them swooping and soaring without feeling at least slightly elated.

What is at least as important is that the plants particularly attractive to butterflies are just as pleasing to the human psyche. All are colorful; most offer delicious perfume too. In addition some of these genera are equally alluring to hummingbirds, those tiny jewels of the bird kingdom.

The sharp botanist will notice these are all summer-blooming genera. Most butterflies do not appear until the weather is warm and settled. Indeed, those of us who try to capture them on film are only too well aware that these graceful fliers prefer hot sunny days to cool, cloudy ones. It is not easy under any circumstances to photograph live butterflies, but one must definitiely count perspiration as one of the fringe benefits.

Like many children, I caught my share of butterflies both by hand and later with a net. There was even a time when I considered becoming a lepidopterist. Maturity grants one a different viewpoint, of course, but I derive more pleasure chasing them with my camera than I did when the object was to add a specimen to my collection. The challenge is greater by far, and certainly the butterflies enjoy it more too.

Before we go into horticultural details, a few hints about photographing butterflies. Never put your body between the sun and the insect; your shadow causes instant alarm. For those who use light meters, use the fastest setting consistent with your film and set the meter against the sky since you are apt to be pointing in that direction. You will get better results if your pictures are slightly underdeveloped than if they are washed out by too much light.

I can guarantee that a button-bush in bloom will collect butterflies in astounding numbers.

Be patient.

Notice which flowers are currently being visited, then sit quietly and wait until a butterfly comes along. If you have a particularly enticing bloom, set up the camera on a tripod and try to focus ahead of time on the area where the insect will be.

Be patient.

Take along a book or something else to do while waiting. Wear a hat against the sun and cover camera with a white cloth to keep it cool if necessary. It seems to scare the insects less if you aim up or straight ahead rather than downward. Smoking is a poor idea.

Be patient.

So now what to plant to attract as many butterflies as possible? The very best genus is the hardest to find, but I finally grew some button-bushes *(Cephalanthus occidentalis)* from seed. This very fragrant native shrub is found in swamps and even standing water in the wild, but mine are doing fine in much drier spots. I did position them so that rainwater collects in their planting holes, and I do sometimes give them extra

irrigation in drought. I can guarantee that a button-bush in bloom will collect butterflies in astounding numbers. Bees are attracted too. Watch out you don't lean into one while following a butterfly with the camera.

Almost as good a draw and much easier to purchase is the butterfly-bush *(Buddleia)* which comes in white, lavender and reddish shades. It flowers from mid-summer until hard frost if old blooms are periodically removed. The flower spires cut well too and make a nice contrast with the many daisy shapes of summer blossoms. For sheer length of bloom time, it is the star.

In our climate buddleia may die back severely in winter, but a good pruning in early spring keeps the bush within bounds anyway. The praying mantis often takes up a stand in a buddleia. Toward fall you may notice loose butterfly wings under the bush and this usually means a mature mantis is using it as a hunting ground. Since the mantis also eats many noxious bugs, I do not begrudge it a fair catch.

The bushy *Clematis heracleifolia davidiana* is another standout. Its fragrant vivid blue flowers resemble the individual floret of a hyacinth, and they are extremely popular with my butterflies. Hereabouts the clematis dies to the ground annually but easily makes 3 ft. of growth each season. It flowered well even after the terrible winter of '76-'77.

Aside from the buddleia and the clematis, the plants I recommend most for attracting butterflies are natives. It shouldn't surprise us that there is a symbiotic relationship here. After all, the flowers and the insects were existing together long before we began creating gardens. A wild meadow where milkweeds, ironweeds, eupatoriums, lilies, and asters bloom in succession will be alive with gilded fliers for months. Some plants adapt better to cultivated gardens, however, and these are the ones to consider. They flower best with plenty of sun, and all are at least several feet high.

Near the top of my list is perennial summer phlox. It has been hybridized intensely in Europe, but its origins are American. Available in many shades of pink and red as well as pure white, these tall phlox are standbys for the warm-weather garden. I have not noticed one shade attracting more butterflies than another. There are many newer named varieties but the older white Miss Lingard gives bloom over the longest period.

You could assume anything called butterfly-weed *(Asclepias tuberosa)* would be another candidate, but there is a catch here. Some stands of these plants bloom too early for many visitations. As with so many of our neglected natives, little selection has been made so far so the only solution is to find a friend who has later-flowering butterfly-weed and beg some seed this fall. This native is easily raised from seed, and each tiny seedling will in time make a large plant. It does not have the wandering roots of many of its milkweed relatives so is quite gardenworthy. There is also wide variation in the shades of the plant but all will be in the yellow, orange, red range.

Another fine choice is the great tribe of the blazing-stars *(Liatris).* They come in both lavenders and white with numerous species and some named selections or hybrids. I have an unidentified lavender one which blooms in mid-summer and is seldom without a butterfly during peak bloom, but the later white ones do well too. For the back of the border or between shrubs few late summer perennials are better to lend a vertical line. With maturity liatris, too, make large clumps and are then quite breathtaking. Heights vary but most are 3 to 5 ft. tall.

Bee-balm *(Monarda)* is almost as sure to lure hummingbirds as butterflies. There are several species and some named clones in shades of red, pink and pure white. This showy mint family member has some propensity to spread, but it can be kept to neat clumps in the garden by judicious weeding out of extra offset plants. Monardas were great favorites in our grandmothers' gardens where they were known as Oswego-tea, fragrant-balm, horse-mint or wild bergamot. The bruised foliage has a spicy odor.

Some annuals also attract butterflies although not as consistently as the per-

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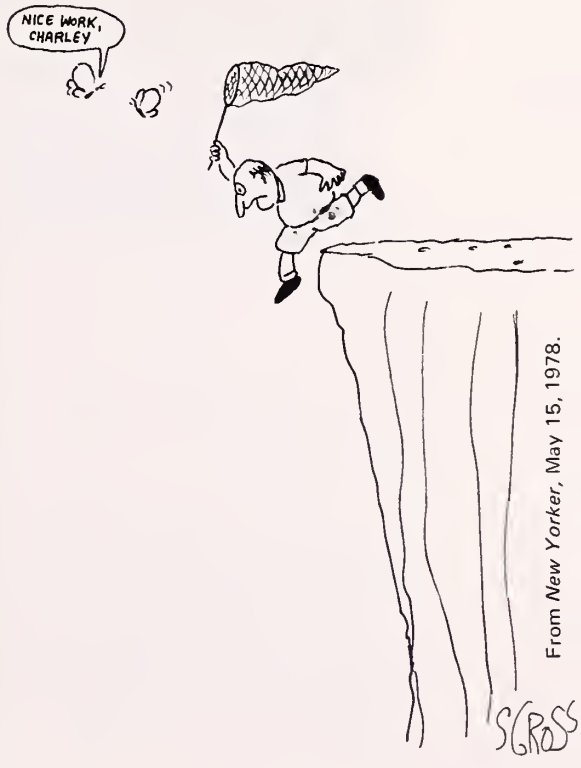

From *New Yorker*, May 15, 1978.

photos by Bebe Miles

Monarch on white liatris shows off wing markings.

ennials just mentioned. Bright colored zinnias, ageratums and cosmos head my list, but you may well find others.

Those butterflies pictured here are some of the larger, more spectacular ones. There are many smaller species such as nymphs, satyrs, hairstreaks and coppers which are equally decorative but harder to photograph. Many of these are drawn to flowers from the composite family.

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The latest book by Bebe Miles, *Wildflower Perennials for Your Garden,* was recently the selection of the American Garden Guild Book Club. She is also producing an annual calendar on gardening for Joseph Hoover & Sons, Philadelphia lithographers since 1856. The latter will be distributed by banks, hardware stores and other such enterprises that provide calendars for their customers.

Yellow swallowtail on button-bush.

callicarpa americana

Among the many plants grown for attractive displays of fruit *Callicarpa americana* is perhaps one of the finest. The bright purple fruit ripens in early fall and is commonly referred to as beauty berry or French mulberry. It is a member of the *Verbenaceae* family in which vitex, clerodendron and caryopteris can also be found. The name *Callicarpa* is derived from the Greek words *kallos* meaning beauty, and *karpos* meaning fruit.

Callicarpa is a deciduous shrub. It has opposite leaves, small flowers occuring in axillary cymes, and grows to a height of about 4 ft. Having a loose open habit, the fruit is effectively displayed on gracefully arching branches. The plant appears to be drought resistant, which makes it tolerant of a wide variety of conditions.

Callicarpa can be propagated by cuttings or seeds. Cuttings taken of semi-hard wood, placed in a closed cold frame or greenhouse will root readily if taken in mid-summer. Seed stratified in fall should give good germination in spring.

Native to southeastern United States, callicarpa is most abundant in the coastal plain and Piedmont regions. In these regions it grows in open woodlands avoiding swamps and barrens. In the mountains of North Carolina and Tennessee it grows in rocky woodlands. Although it grows wild in woodlands, in the garden it produces best growth and display in full sun and good garden soil.

To obtain many of the native plants it is often necessary to collect seed from wild stands. Remember that if seeds are collected from plants that cover a wide geographic area in the south it is best to collect from the most northerly or northwestern areas, or the higher altitudes of the plant's range. That is more likely to insure hardier plants for northern gardens. Seed collected near the coast or in the southerly portions of the plant's range may be less hardy. This concept is not true of all plants but could mean the difference between success and failure with native plants in the garden.

Thomas Buchter

Thomas Buchter is associate director of the Henry Foundation. A member of PHS, he serves on the Library Committee. He is interested in the horticultural value of native plants and in promoting them as garden plants.

Letter to the Editor

debugging plants

When I decided I couldn't put up with the mess and smell of de-bugging plants in the house, I devised a system I've passed on to many friends. Thought I'd share it with your readers.

Place the watered and well-drained plants in clear plastic bags with a piece of vapona pest strip. Twist the top of the bag shut and tie with a twistum. Set this out of direct sunlight for about 48 hours. Reopen the bag and rinse off the dead insects. While reopening the bag, don't breathe the fumes that have collected in the bag. The piece of pest strip can be wrapped in several layers of aluminum foil for further use. Repeat the treatment in ten days, two weeks or whatever the life cycle of the insect being treated may be.

I've found this treatment is effective on scale, white fly, aphids and others. Of course, if all of your plants are infected, they should be treated all at once. The size of vapona strip depends on the size of plant. I use a whole strip for several plants.

Large, *clear* plastic bags that hold several plants can be found if you keep on the lookout. Don't make the mistake I did and use colored trash bags, thinking it wouldn't make a difference for a day or so. The plants barely survived.

A stick can be inserted into the pot to hold the bag up off the plant.

Martha Roberts

continued

photo by Edmund B. Gilchrist, Jr.

osmanthus fragrans

The hope of every indoor gardener is to find a plant that looks well all year, blooms constantly, is pest-free and permanent. There is, of course, none such. However, *Osmanthus fragrans* comes closer than most.

Its greatest asset is its bloom habit. Clusters of tiny, cream-colored flowers appear in great profusion from October to June. They are deliciously fragrant, and when your plant gets as big as ours, they perfume the whole room.

O. fragrans is a woody plant. It is described in Bailey's *Cyclopedia of Horticulture* as a small tree, to 30 ft., or shrub, native to the Himalayas, China and Southern Japan. It has an ungainly growth habit when young, but mature plants that have been pruned repeatedly and carefully become relatively compact with a pleasing pattern of branches and twigs. We have been training our plant for nearly 20 years.

Each leathery dark green leaf has a two-year life span. We prune, root prune and repot, if necessary, in late June when our plant is summering on a shaded terrace. In winter it is in the sunniest place we have. I water it every day and fertilize it once a month in spring and summer.

Prolific blooming requires constant clean-up of the fallen flowers. A small price to pay.

Ernesta D. Ballard

Ernesta D. Ballard is president of PHS and author of *Garden in Your House* (Harper and Row).

ornithogalum caudatum

In 1970 at Lee Lester's Graterford greenhouse, The Potting Shed, I was captivated by a South African plant of the lily family, a green bulb sitting on top of the soil in its pot from which came forth six or seven long fleshy strap-like leaves. This *Ornithogalum caudatum,* false sea onion, came home to live in my glassed-in porch. Eight years later I am more amused by its habits than awed by its appearance and look forward to its annual flowering. This consists of one long leafless stalk at the end of which is a long-lasting raceme of dozens of flowers, white with a green median stripe much like those of the weedy *O. umbellatum* (Star of Bethlehem), *O. thyrsoides,* common in the florist trade and *O. nutans,* a good species to naturalize in Delaware Valley gardens.

The flower stalk begins to grow upright in March or April. Then, unlike the one pictured here, mine becomes horizontal with wave-like curves as it lengthens. In about two weeks the many flowers begin to open and continue to do so for several weeks. This year's foot-long-stalk-plus-raceme equaled the length of the longest leaf. The ovoid bulb is now 4 in. in diameter.

As it grows the bulb sheds its loose membranous outer skin which tans and peels like that of an onion. This happens many times during the year. Tiny bulblets form with frequency inside the bulb and work their way to the surface as the layers peel off. When a bulblet, green like its parent, reaches the real world it falls off and starts a cycle of its own on moist well-drained soil. A two-year-old offset from my plant produced a 2½ ft. flower stalk this spring.

My parent plant's pot hangs from a pot clip on the porch wall so its long leaves can hang freely. It does well with a winter night temperature of 50°F, with bright light but only a little early morning sun, and frequent light feedings with Peter's soluble fertilizer. I have had to use insecticide once for scale.

To have a bulblet of your very own send a self-addressed stamped envelope to me at PHS and wait patiently.

Charlotte Archer

photo by Dr. A. B. Graf

Charlotte Archer is the PHS activities coordinator. Her adventurous and exploratory approach to horticulture is revealed in her vegetable and cutting gardens—in bushel baskets in her driveway.

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Pennisetum alopecuroides (foreground)
See page 23.

An Iceland poppy by artist Henry Evans. See Books for Christmas, page 25.

THE green scene

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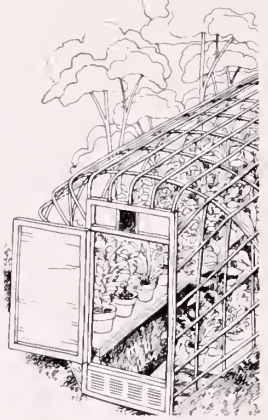

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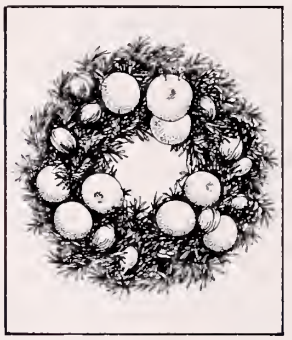

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THE green scene

HORTICULTURE IN THE DELAWARE VALLEY

Volume 7, Number 2 Nov./Dec. 1978

published by
THE PENNSYLVANIA
HORTICULTURAL SOCIETY
325 Walnut Street, Philadelphia, Pa. 19106

THE GREEN SCENE, (USPS 955580) Volume 7, No. 2, published bimonthly, January, March, May, July, September, November, by the Pennsylvania Horticultural Society, a non-profit membership organization at 325 Walnut Street, Philadelphia, PA 19106. Subscription: $7.50 — Single Copy: $1.50. Second class postage paid at Philadelphia, PA 19104.

POSTMASTER: Send Form No. 3579 to THE GREEN SCENE, 325 Walnut Street, Philadelphia, Pa. 19106.

in this issue

CORRECTIONS:
Thanks to the many alert readers who let us know that we had mislabeled the ornamental grass photo that appeared on page 23 in the September 1978 issue. It should have read *Liriope muscari variegata.*

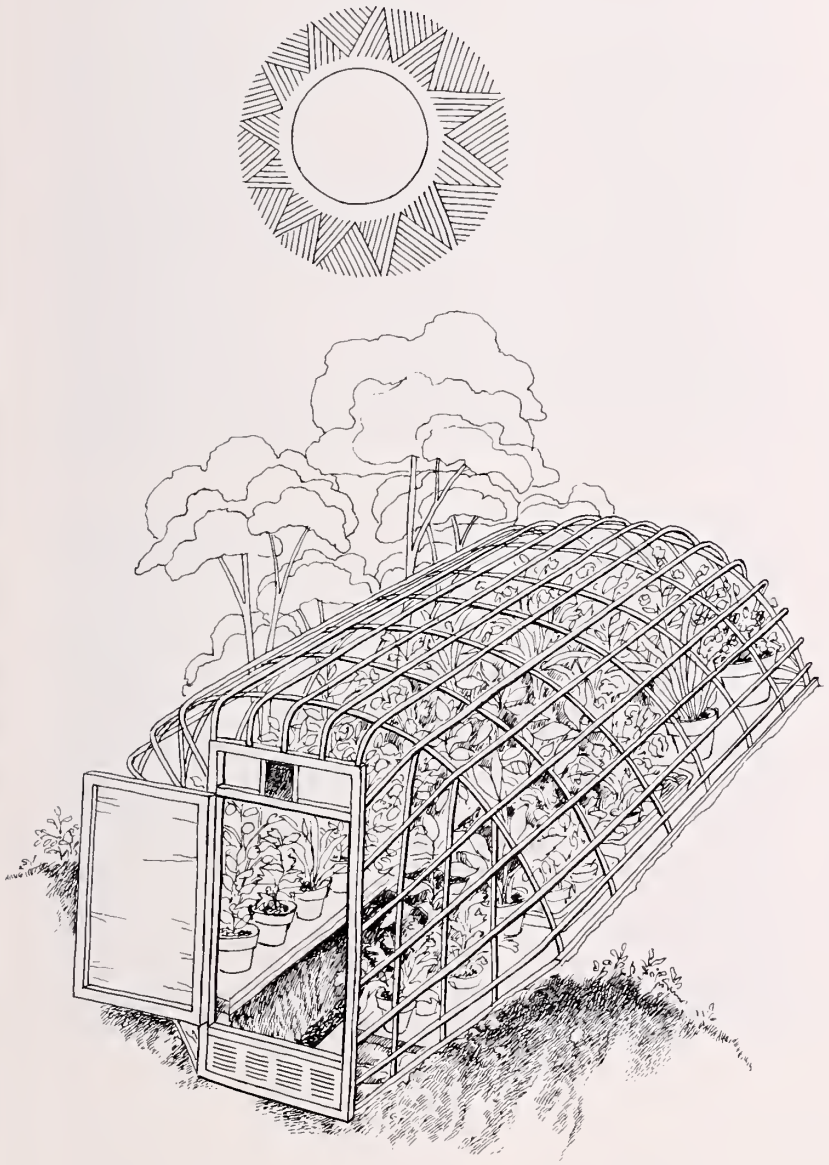
• • •

Identifications were inadvertently omitted for the lovely drawings by Léonie H. Bell accompanying the "Wildflowers in Philadelphia" article. They are: page 20, *Galinsoga ciliata;* page 21, *Hibiscus trionum;* page 22, *Portulaca oleracea.*

AN ERRANT DESIGN

A greenhouse plan goes astray to become a year-round garden under the bamboo.

by Albert J. Webb



Having a large, heavily wooded site with one choice sunny spot—a ledge jutting out over a quarry —is just the challenge an architect likes when he dreams of designing a greenhouse. For a long time I have contemplated creating one—not a conventional greenhouse but one designed for this unusual location. I have made numerous sketches: some showing it cantilevered out from the face of the quarry and others snuggling it into the hillside creating a combination greenhouse-pit. Since I have always been fascinated with the principle of the sun-heated pit, I found many interesting ways to incorporate this concept into the various plans. Despite my long interest and numerous ideas, however, the simple little dome-covered pit of this article is a far cry from the greenhouse and pit of my imagination; its origin was more a matter of chance since it evolved quite unintentionally.

Before thinking any more about a greenhouse, other projects demanded priority and the most recent one, the construction of a large terrace, supplied the impetus to create simultaneously the little plant pit.

Space for the terrace necessitated removing a tall stand of bamboo and, because of the size of the terrace planned, soil for fill was needed. The obvious source for it seemed to be the ledge that we had reserved for the greenhouse and by excavating there, we were actually partially preparing the site for the future.

continued

Pink camelia

All this pleasure and satisfaction has been ours for a minimal cost —less than $100.

digging

We dug a trench 2 ft. wide, 4 ft. deep and 10 ft. long into the bank with the long axis facing south. More fill was needed so a shelf was dug on three sides and, behold! the germ of a sun-heated pit began to develop. At last my longtime interest in the pit was actually taking form. It seemed logical to enter at the low side and we quickly improvised two descending steps. Meanwhile, as the terrace progressed, potted plants were set down in that sunny, protected area to be rejuvenated and brought into full flower. That proved so phenomenally successful that we began to think of a quickly constructed cover for the pit. And there stood those tall stalks of bamboo.

In the manner of the Roman barrel vault, bamboo canes were bent to form a dome shape to cover the pit, the overall covered space being approximately 7 ft. wide by 12 ft. long. The large ends of the canes were spaced 16 in. apart and inserted approximately 12 in. into the ground on both sides. These ribs were then bent to form an arch and were securely tied with plastic-covered wire to a ridge pole. Maximum head room is 6 ft. 4 in. Horizontal members, tied in the same manner, formed a basket-like structure. It is sturdy, does not move and can bear a great deal of weight as was proved in last winter's heavy snows. Also, its rounded form snuggles into the hilly terrain and, while trapping sunlight on all sides, allows winds to flow easily over it, thus remaining safe in stormy weather.

The curved form of the bamboo skeleton enabled us to cover it with a single sheet of plastic, 12 ft. x 22 ft. Six-mil polyethylene was used and first sprayed on both sides with "Sun Clear," a no-drip coating. We discovered that was necessary to prevent condensation on the inside and it also helped to keep the plastic clean on the outside. After the first winter, an energy-conserving device was made with three one-inch sheets of styrofoam, 2 ft. x 8 ft. Two were left as is but scored lengthwise in order to bend them to the shape of the dome. These were placed horizontally on the north side for added protection during severe winter months. The third sheet was cut into two-inch wide strips, scored, and applied vertically over the ribs on the other side and the ends. Over the styrofoam a second sheet of plastic, the same size as the first, completed the dome's air barrier. No nails are used in the structure (with the exception of the door frame) since its rounded surface permits pleating and folding of the plastic at the ends. Around the outside perimeter, the plastic is held close to the structure by placing flat patio blocks around the dome on top of the 18 in. apron on the ground.

With the plastic in place, the finishing touch of the entrance remained to be completed. The tiny door on the east end, 2 ft. x 3 ft.-4 in., is actually an architectural sample of an industrial, steel casement window. This was set into a wooden frame at a slope corresponding to that of the structure. Above it a space is provided in the frame to insert a fan for air changes. The sill of the frame is 12 in. above grade to permit installation of a ventilator. One steps over the raised sill (making entry easier in winter snow) and goes down two steps. In warm weather, more air is supplied by opening the door or lifting the plastic at the far end. There is an element of mystery and expectancy in climbing through that little door and descending into the pit.

heat, water and pests

Although the sun is the chief source of heat and maintains the desired temperature, we knew some form of auxiliary heat would be necessary during winter's coldest months. A 1,000 watt heater (with fan) salvaged from a discarded dishwasher solved this problem. A 100-ft. underground cable was run from the basement to the plant pit. The heater and a thermostat were hooked up—and we were in business. During sunny days in winter the temperature in the pit often reaches 90°. For nights and cloudy days we found that setting the thermostat between 45° and 50° was sufficient to augment the heat collected from the sun and to provide adequate temperature. Even during the last two severe winters this proved adequate. The added layer of plastic substantially cut down on heat loss during the second winter.

Drainage within the pit has never presented a problem because of its quarry ledge location. Its little floor of flat patio blocks imbedded in cinders is always dry. Yet, the pit is always

continued

1

The author in the sun pit
◀

Photos 1, 2, and 3 were taken in the spring. Some plants remain here all year-round; others are on the terrace during peak bloom season.

Camelias, geraniums, calomondin orange trees and nicotianas

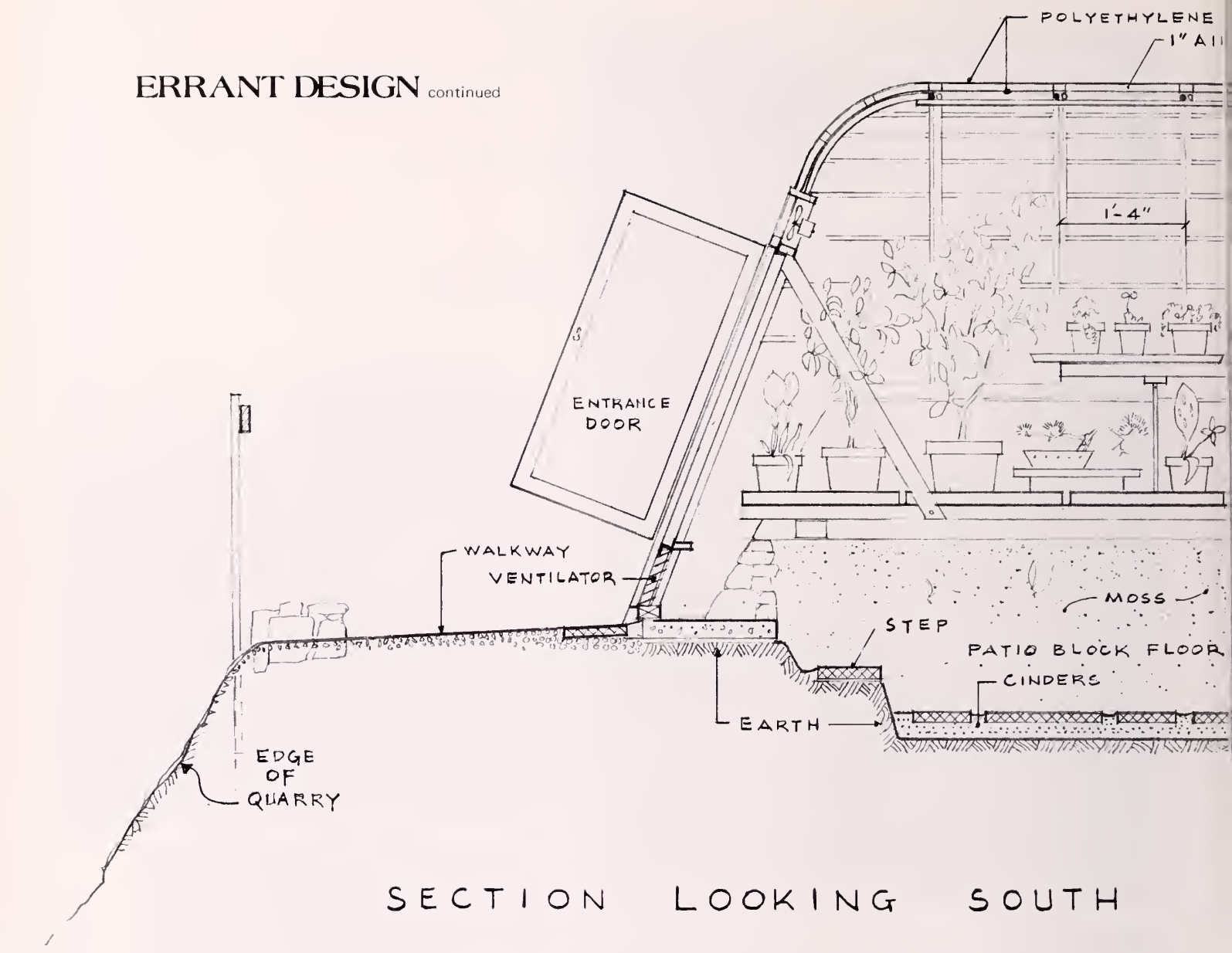
2

3

4

photos by author

5



SECTION LOOKING SOUTH

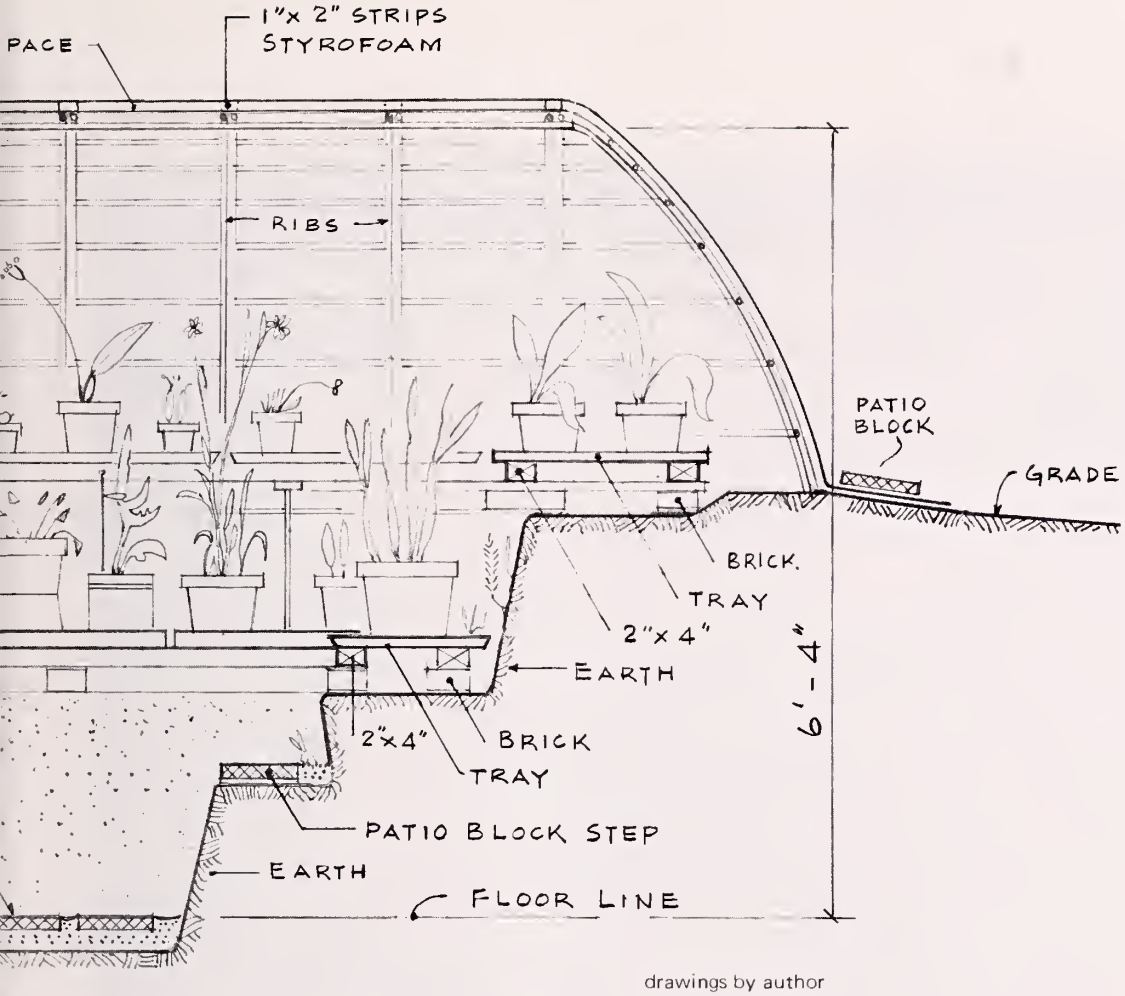
humid and very little watering is necessary during cold, sunny days. The needed water is easily supplied by carrying it in a few gallon jugs to the pit, and we usually leave several filled jars there to warm for the next time. It would be a simple matter to run a water line from the house but it hasn't seemed necessary. It is easy to reach all the plants with a long-spout watering can. Because of the ideal humid condition, the earth sides within the pit are covered with a lovely patina of green moss, dainty fern spores, and volunteers of *Helxine soleiroli*.

So far we have experienced no real problems with insects. The usual plant pests of white fly, mealy bug, and aphids are kept under control with occasional spraying.

What fun it is as winter days arrive to enter through that little Alice-in-Wonderland door and be greeted by such a tropical scene. It is exciting to see the profusion of color produced by nicotiana, begonias, dianthus, geraniums, calendula, clivia, calamondin orange tree and camellias. Every plant blooms with more vigor than it did outdoors in the summer and none has been lost in cold weather. All this pleasure and satisfaction has been ours for a minimal cost—less than $100.

The ultimate use of the pit has not yet been decided upon as we are enjoying experimenting and have been content to use it mainly for winterizing plants. Imagine my delight on a cold, fall day as I move all the potted, blooming terrace plants to the safety of the pit. Its potential, however, far outreaches the winterizing of potted summer plants. We are considering devoting the pit to cool-growing woody plants, and it is easy to envision it full of camellias. Or, it could be used solely for ferns, or winterizing bonsai, or for raising seedlings or forcing spring bulbs. Other uses come to mind as we remember growing orchids on a windowsill and in a Wardian case—how useful this little structure would be for cool-growing orchids!

In the future, we intend to experiment with a self-venting solar device that will open and close automatically. Also, to add to the effectiveness of the double plastic covering, we hope to devise a system whereby the hot air from within the enclosure will be re-



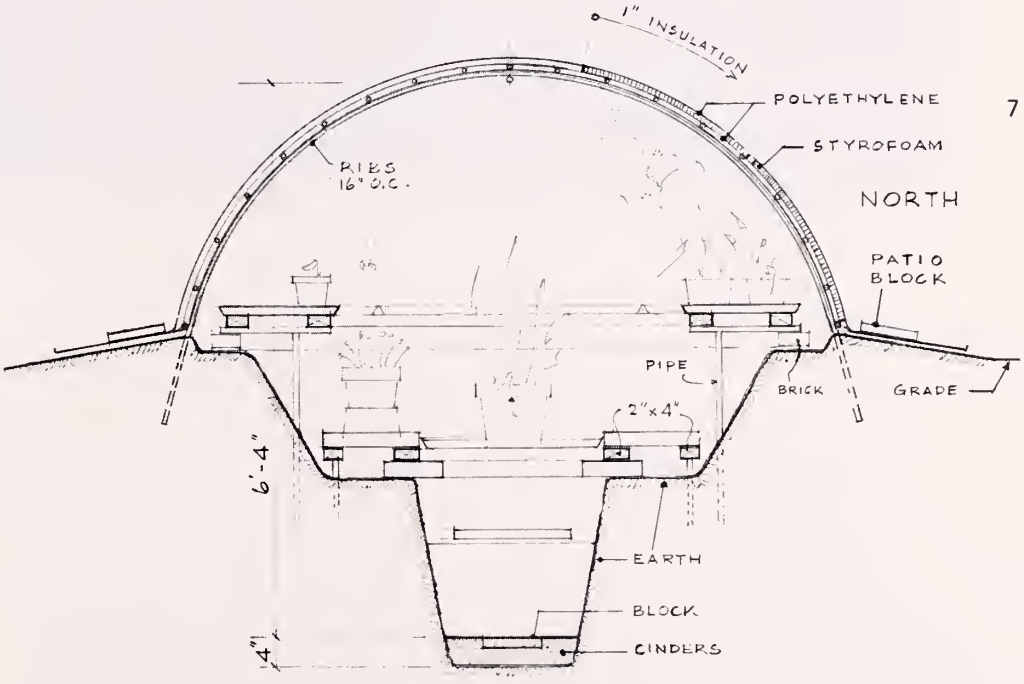
drawings by author

circulated into the air space between the two plastic layers, forming a warm jacket for winter nights.

The dome-covered pit, which "just grew," has been a source of great fun and a challenging experiment. Now we must assimilate the whole new assortment of ideas it has generated. Then—eventually—on to another set of plans for that dream greenhouse, which surely will incorporate using this wonderful little dome-covered pit!

●

Albert J. Webb is an architect who has enjoyed a life-long interest in horticulture and botany. His study and many field trips with the Philadelphia Botanical Club and the Torrey Botanical Club influenced him to narrow his interest largely to wildflowers. He has cataloged about 200 specimens on the wooded site mentioned in this article.



CROSS SECTION

photo by Elizabeth Sluzis

Cyclamen indicum

Cyclamen: Hardy and Tender

by Helen L. Guy

I first came across hardy cyclamen a couple of years ago on the farm of a friend who has lived and gardened in the same spot for 50 years. The tiny flowers, with reflexed petals stood no more than 3 or 4 in. high, and were an absolute surprise and delight to me as I had only ever seen the larger florist's varieties at Christmastime. These miniature pink fall flowers, which survive our winters in fine shape, have been blooming where they were planted 10 or 15 years ago. They are tucked in under viburnum along with ivy and spring perennials just to one side of a stepped path where they can be seen from the front porch.

These Mediterranean exotics deserve greater attention than they receive jn horticultural literature because they are not at all difficult to grow and do well either in the ground or in pots when provided with excellent drainage and soil preparation, a shady location and moderate moisture.

It was on this farm, too, that I learned how to bring the florist's cyclamen into bloom year after year. Finding how to do that was exciting to me because I had always tossed out the tubers when leaves and flowers were gone. My friend's solar heated glass enclosed porch turned out to be part of the secret.

Cyclamen neapolitanum is the hardiest in this area and requires no special protection aside from what surrounding shrubbery may offer. Other species (for example, *C. coum* and *C. repandum)* need to be mulched heavily to guard against the damage of spring freeze and thaw. With this special attention the cyclamen enthusiast could plant the less hardy species and enjoy continuous bloom from January to September, with petal colors ranging from white to deepest pink, and leaves that are solid green, mottled, or quite silver. Some leaves appear before the flowers, some after. The possibilities are endless.

The florist's cyclamen, *C. persicum* and its many named cultivars, offers a myriad of possibilities as well, from the most delicate whites and pinks, to deep pinks and fuchsias.

cyclamen neapolitanum

This past spring we decided to plant more *Cyclamen neapolitanum* along with the already existing ones. The brown tubers, which sometimes grow as large as 6 or 7 in. in diameter, arrived in April, ready to go, all in good condition. They were plump and sprouting roots from all sides, top and bottom. (A word about planting cyclamen tubers: the tubers may or may not arrive with roots. Regardless of where these roots are growing, the tubers are to be planted **concave side up**.) Sometimes flower stems are poking through, and they are easily distinguishable as they are fleshy and pinkish in color, and they too designate "This Side Up."

soil preparation

Careful soil preparation makes good sense as hardy cyclamen can remain in the same spot for as many as 25 years.

I dug the soil to a depth of several inches in an area that was to receive four or five tubers, allowing 5-6 in. between tubers. The following soil mix provides the necessary good drainage and nutrition for abundant leafy growth, strong roots and flowers:

2 parts loam
1 part sand
1 part rotted manure
1 part leaf mold
sprinking of bonemeal or superphosphate

The easiest way to mix thoroughly is simply to remove the soil to a box or pail, make the necessary additions, mix with your hands and return to the ground. The soil can be packed slightly where the tubers are to go and covered with 2 in. of the same soil mix. After watering lightly mark the site with labels to avoid digging into and damaging the tubers. Leaf and flower stems are relatively brittle and break off easily if handled carelessly. It is neither necessary nor desirable to keep watering the tubers as summer showers and a protected location provide enough moisture.

By August the pinkish stems bearing flower buds will have appeared and you need simply sit back and await a true gardening delight. The dark green leaves emerge after the flowers and provide an attractive ground cover from

continued

By January they had become all show. No other flower can compare in delicacy and purity of color.

November to May. Each summer after the first year of bloom, a thin layer of topsoil and fertilizer can be added to replenish nutrients and soil that may have washed away.

propagation

Propagation of both hardy and tender cyclamen is simple: the easiest method is from seed but vegetative propagation is also successful when an eye or bud is included with each piece cut from the original tuber. Vegetative propagation has the advantage of insuring exact genetic reproduction of a particularly desirable trait such as the color of the flower. I have never tried vegetative propagation, however, so I will describe the use of seeds.

The percentage of successful germination is high if the seed has been properly collected and dried from one's own plants or purchased from a reputable importer. Although cyclamen are self-fertile, they do not produce the honey so attractive to insects. That means that seed set is not abundant, making seed collection a careful business and the purchase of seeds and tubers relatively dear.

Self-propagation of cyclamen is an ingenious adaptation. Once the flowers are spent and seed formation proceeds, the flower stem begins to coil until it is wound tightly like a spring close to the tuber. The seed capsule cracks open when it is dry, the stem uncoils and the seed is catapulted from the mother plant. Thus a cyclamen colony will enlarge over the years. If the gardener is interested in collecting the seeds herself, the best time is in the summer. A careful watch insures that the seeds are not sprung and lost to the ground. When the capsules are dry, pluck them, remove the seeds, which will be slightly sticky, and dry them before sowing. Be sure to keep seeds labeled separately by varieties. Even if the seeds are not to be planted, they can still be removed to keep the tuber strong and save energy spent forming the seeds.

If quantities of seed are to be planted they can be set out in rows in a wooden flat. Bulb pans work well for just a few. The same soil preparation is used for the seeds as for tubers in the garden. The recipe for the soil mix may seem too elaborate, and I must note here that a friend raised cyclamen for the Flower Show two years ago and used the usual commercial soilless mix with great success. I believe she came home with prizes. She did, however, have to water more frequently to avoid wilting, and she fertilized at quarter strength with each watering.

germination

We sowed the seeds 2 in. apart and covered with an 1/8 in. of soil and watered them in. The seeds need darkness to germinate so we placed a layer of thick plastic with a piece of cardboard on top for shade, and chicken wire between the soil and plastic to provide some air circulation. I suppose we could just as easily have eliminated the cardboard and used dark plastic instead. The seeds should not be allowed to dry out but neither should they be constantly soaked.

The literature that arrived with our seed order implies that germination can test the patience of the most dedicated gardener as it may vary anywhere from 2 or 3 months to 18, depending upon the species. With this in mind I decided to peek occasionally at the seeds but not expect too much too soon. Imagine our surprise, then, when we drew off the cover for a cursory check, barely two months after the April planting, and found neat rows of seedlings, each capped by the unmistakable sight of a cyclamen leaf. Off came the covers, we watered lightly, and the flat was moved to a shady spot.

When the plants are touching they are ready for their own 3-4-in. pots, using the soil mix already described. Once the plants have crowded the pots with roots to the walls, it is time for a 5-6 in. pot where the plants will bloom the following year. The plants should be watered occasionally and remain shaded from direct sun until the winter months when the sun is lower in the sky.

Hardy cyclamen can remain in their pots until the tubers are of reasonable size and then be moved to a permanent spot outdoors. Florist's cyclamen will remain in their pots for a few years until they graduate to a larger container. Most tubers, with some exceptions, are planted half-in, half-out of the soil. The importer usually includes instruction for those that should be completely covered with soil.

self-perpetuating

And what about the florist's cyclamen? They bloom for two, perhaps three months, and, when I was a youngster, they quietly disappeared into the trash. They were a mystery to me—a wondrous gift from the professionals who held all the secrets. The mystery unravelled one fine day in June when I spotted several pots on a wire rack in the shade. The cyclamen leaves had wilted and turned brown but no one was making a move to throw the tubers away. In fact, the cyclamen were on vacation—renewing their strength for sprouting new leaves in September. Such a resting period is not uncommon among perennials. Daffodils, too, rest

during the summer after their leaves have done their job, photosynthesizing energy to be stored in the bulb for the next bloom.

Before the first frost the pots were placed on a table in the enclosed porch where they would not get too much direct sun. Watered occasionally, the tubers continued to send up new leaves until December when flower buds began forming, reaching towards the light beyond the leaves. By January they had become all show. No other flower can compare in delicacy and purity of color. The leathery, marbled green leaves offer a pleasing contrast to these blooms, these lovely butterflies caught in stillness.

The other secret to growing the florist's cyclamen pertains to temperature. In the winter they are as sensitive to freezing as they are to too hot a house. They do best if the greenhouse or porch temperature rises no higher than 55°F during the day and 60°F at night. High temperatures interfere with flower bud formation and bloom. The cyclamen that comes into too warm a room may simply drop its buds and wilt. These cyclamen too need only an occasional watering.

Mine is a happy ending to a lovely gardening experinece: plant masses of hardy cyclamen, give them a shady spot and a well-made bed. Do not drown them and they will reward you with their delicate beauty. Next summer, give your spent, florist's cyclamen a second chance. Keep them around until you have tried to bring them through another season.

●

Helen Guy is an enthusiastic gardener. She attended classes in horticulture at Temple University in Ambler. Her aspirations include writing and botanical illustration.

art by Helen L. Guy

Cyclamen neapolitanum with *Vinca minor*

WREATHS FOR EVERYWHERE

by Lorraine Kiefer

Handmade wreaths are an expression of the individual who crafted them, as well as a reflection of their environment. For example, a weed wreath using dried weeds, pods, and things found along the beaches, marshes, and fields of the Jersey coast will have a seashore look. One made up of the evergreens native to the cool northern forest areas will have a completely different effect.

Although commonly hung on doors and windows, people are beginning to use wreaths throughout the house in unique spots. At my house gingham wreaths hang on doors in the bath and laundry rooms, straw wreaths with wheat and grapes dress up the kitchen, and a large wreath of dried materials dominates the dining area. Pine cone wreaths punctuate the red and white living room, while colorful gingham ribbon wreaths dot the family room. Sachet and herb wreaths are tucked into small spots in the powder room and in hallways, while a braided bread dough and ribbon wreath finds a spot on a kitchen wall. All of the outside doors and the large Colonial windows in the front of the house sport a large evergreen wreath dressed with an ample velvet bow.

Wreaths can be used as tabletop decorations by placing them around punch bowls, candles, or a special holiday cake. This year I am making small candle wreaths from houseplant cuttings which will be used as centerpieces, favors, and gifts for plant-loving friends and neighbors.

They can be made by using oasis and the low circular floral dishes. Cuttings can be arranged in a circular manner, with a tall red or white candle placed in the center. A red ribbon or ornament can be added to give a bit of color to the finished product.

what to use

Materials for wreath making can be collected almost any time of the year. Our craft room is lined with peach baskets that hold a variety of cones and pods. These are picked up everywhere. Some of the nicest cones have been found near the landscaped areas of malls, restaurants and even in cemeteries. Yards with established evergreens yield quantities of cones, as do woods.

Wire bases for some of the wreaths range from heavy wire coat hangers to three ring wire frames found in garden shops. Large, thick styrofoam rings are best for weed wreaths and others requiring the use of picks.

Wreaths made from dried materials and pods are beautiful and long lasting. Choice of materials can make the texture a real work of art. Materials such as pearly everlasting, goldenrod, pye weed, and the many seeds and pods found in the wild are also found in fields, vacant lots and along railroad tracks. Items such as baby's breath, strawflowers, statice, and herbs can be picked in the garden and dried, or purchased from a grower or floral supply.

The brown and beige materials can be found in the fields almost anytime of the year, and now is the best time. Brightly colored items are best collected and hung upside down to dry just before they reach their peak of bloom. Many plants, such as pearly everlasting and goldenrod dry best if picked while they are still in the bud stage. The pearly everlasting is the best of the white fillers if collected when the buds resemble a barley grain.

When I collect plants to dry, I tie them in bunches with rubber bands or wires and use Christmas ball hooks or paper clips to secure the bunches to the drying wire stretched across my attic drying room. Most of the everlasting flowers can best be dried in this manner also.

weed wreaths

The weed wreath is simple to make but will take some time and a variety of dried materials. Assemble the materials you plan to use. Be sure that there are some special interest items such as the deep scarlet spikes of berries found on the highland sumac in the late fall. Pods of dried okra or small hot peppers also add interest to a weed wreath. Some other materials used for their interesting color, shape, or texture are rose hips, tansy blooms, wood roses, large thistle, protea, Chinese lanterns, honesty, yarrow, strawflowers, baby's breath, and love-in-a-mist.*

Start the wreath by carefully placing the stem ends into the outside of the styrofoam rings, since the size of the wreath is set by this first row of materials (illus. 1). A combination of natural colored fillers such as pepper grass, dock, pearly everlasting, and goldenrod all work well for this step. Each additional row is slightly shorter than the one before it.

Most of the stems will be perpendicular with the surface of the styrofoam, except when the materials begin the turn over the edge of the ring. As shown in illustration 2, the angle of the stems to the styrofoam must change to form a smooth curve on the surface of the wreath. Shorter pieces are used to fill in the surface of the wreath. Filler is still used but pods, cones, and flowers are used also (illus. 3). The colors and textures, as well as the special interest materials, will give the wreath its distinction. A velvet ribbon or accent piece such as a bird can be added if desired.

The wreath is more appealing when an abundant look is achieved. Nature illustrates this abundance each autumn when apples, pumpkins, and the harvest in general cascade from stem and basket. In early spring when the first violet is cherished, a single bloom in a vase will do beautifully, but the autumn dried materials in most cases show their beauty in their collectiveness, rather than as individual specimens.

As fragile as they might look, these wreaths are durable. My original is at least eight years old. It has been out to several lectures a year, as well as on

*See list for botanical names on page 16.

the Captain Noah television show. I add a few new materials each year, along with a new ribbon from time to time. A two-inch thick stryofoam ring will insure a long-lasting wreath.

straw wreaths

The straw wreath idea comes from peasants as far back as the Middle Ages, when they used wheat loosely wreathed as holiday decoration. The wheat in Christian tradition represents the Eucharist, with the circular shape symbolizing eternity.

A homemade straw wreath is easily made on a triple wire ring. Mine was a spur of the moment project that turned out better than anticipated. A trip to our henhouse where several handsful of straw were pulled from a new bale supplied the material. The straw was fitted in and around the three wires that formed the ring, and wrapped with a thin green wire. The wire was not very noticeable as it was well covered with the "rustic" arrangement of straw. Shafts of wheat were woven in with the straw in spots, and finally a bunch of it added as a finishing touch. Grapes, either artificial or real, can be added also. My wreath has kept well for many years and has been trimmed with several different items. One year a cornhusk doll and gingham ribbons were added, while another year strawflowers and pods dressed it up.

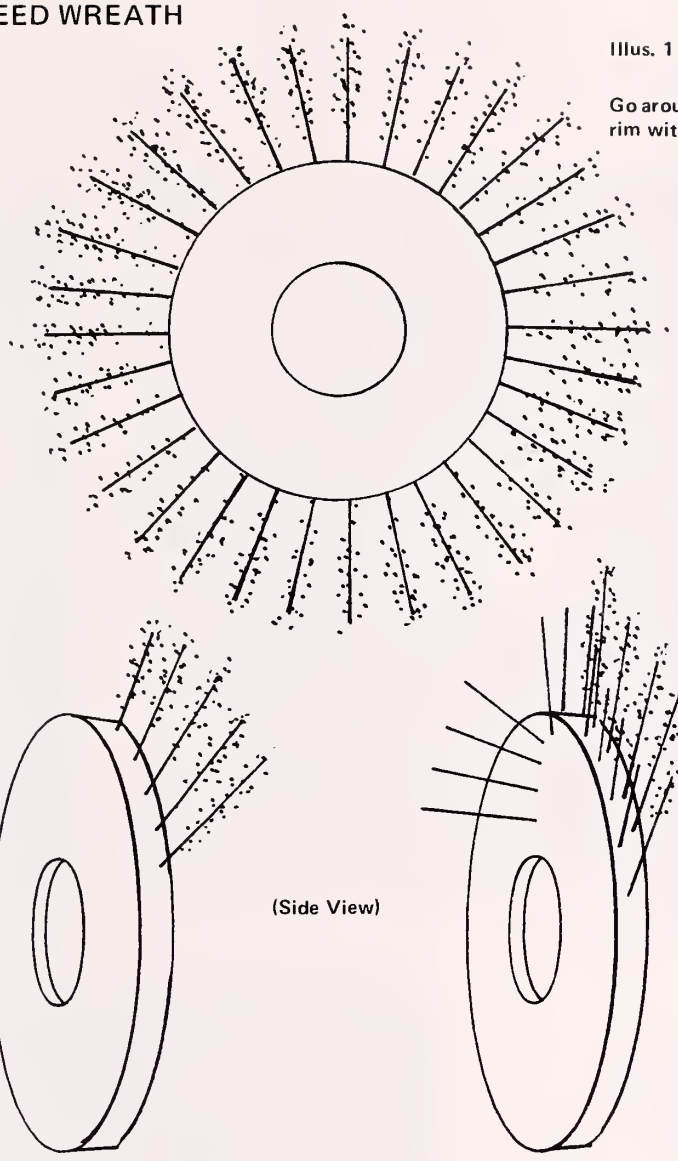
pine cone wreaths

Pine cone wreaths are a project that take much time. Just collecting the cones and pods can take several seasons. I always tell my students to start now for next year.

Use triple wire rings stuffing the bottom layer with the long, thin cones of the white pine. These cones are placed between the wires and wrapped once with a continuous strand of wreath wire. Damp cones are "closed" and more pliable making it easier to stuff them between the wires. They open when dry, giving a very secure fit.

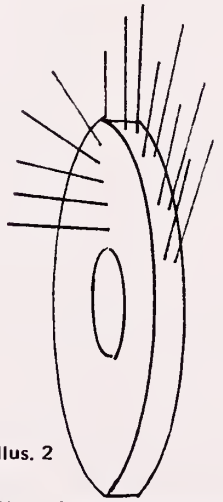
continued

WEED WREATH



Illus. 1

Go around outer edge of wreath rim with filler material.



Illus. 2

(Note: Plain lines represent stems of material so that proper angle of insertion may be seen more clearly.)

As you finish the outer edge, gradually come up and over changing direction of material—stems will be perpendicular to base.

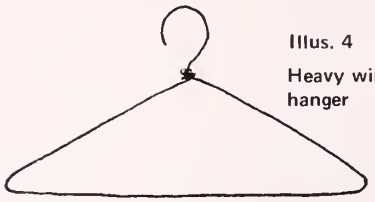
Illus. 3

Outer edge: plumes, feathery material, puffy filler

Filler material

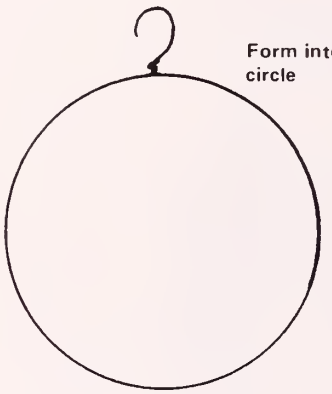
Accent: cones, pods, dried flowers

EVERGREEN WREATH ON A COAT HANGER

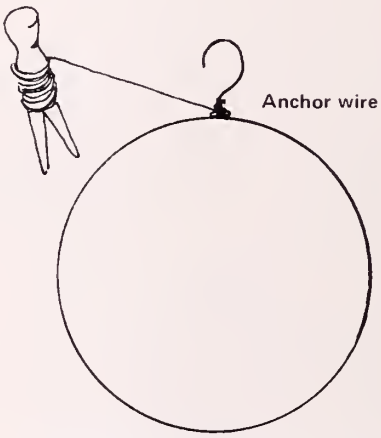


Illus. 4

Heavy wire hanger

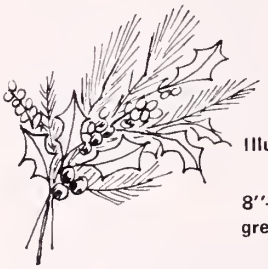


Form into circle



Anchor wire here

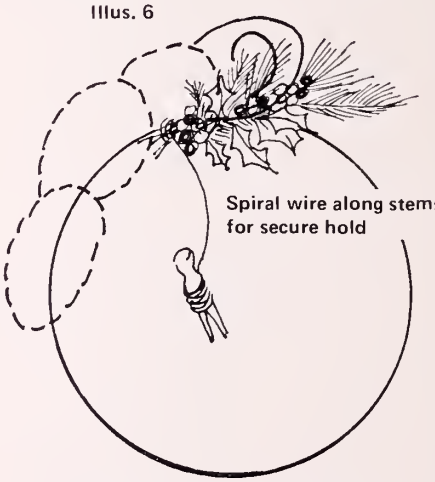
Wrap wire onto clothes pin to size of walnut.



Illus. 5

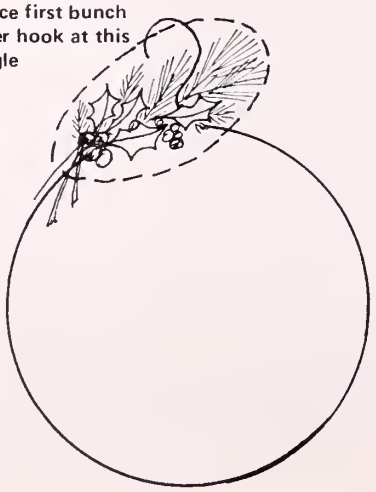
8"-12" bunches of greens

Illus. 6



Spiral wire along stems for secure hold

Place first bunch over hook at this angle



Second bunch goes in at such an angle it covers hook and starts shape of circle. Continue around repeating bunches.

(Note: Egg shapes represent individual bunches.)

The top layer of cones can be put on in several different ways. I prefer to make an arrangement of cones and pods, wiring them with a continuous strand of wire. This method has proven to be longer lasting than the glue method and more flexible than individual wires on each cone. The continuous strand is strong and secure also.

The round cones of our local pitch pines make up much of the wreath, with the more exotic cones and rosettes cut from the sugar pines filling in for accent. I do use glue to tuck hemlock and larch cones in small crevices between the large round cones.

The best kind of glue to use when working with cones is water soluble linoleum paste. This is very thick and light brown in color when wet. It dries to a hard dark brown that is not noticeable with most cones.

A touch of clear spray brings out the luster of the cones and also refreshes a wreath that has been stored. If trims are used, lacquered fruit is a good choice. Plastic fruit does nothing for a cone wreath. Velvet ribbon compliments the rich color of the cones.

evergreen wreaths

As a young 4-H member I learned to make a simple wreath on a coat hanger. Since then the evergreen wreath has been a traditional part of my holiday preparations. My brother and I had a wreathmaking business as teenagers and now my sons do.

Traditionally, Thanksgiving weekend is the start of the evergreen wreaths at Triple Oaks. Mountains of evergreens fill the laundry room, constantly being replenished as we make wreaths for all the front doors and windows. We wait until then to prune the many huge native holly trees on our property. Greens are also collected from several acres of pine, spruce, and cedar. We also use shrubs such as Japanese holly, yew, juniper, and others that grow in the yard to supply an interesting variety.

Green wreaths can be made on coat hangers, commercial wreath rings, old tire rims, or even hoola hoops. (If hoola hoops are used, cover the plastic with a rough or sticky tape so that the greens won't slip.) The easiest and most economical way is to form a strong

continued

photos by Ted Kiefer

Author works on evergreen wreath

Evergreen wreath completed

Weed wreath

coat hanger into a circle by rounding out the corners. Do not unhook it (see illus. 4, page 14). The hook is used to hang the wreath.

If the hanger is of thin wire and seems to bend, use two, wiring them together.

I usually buy a large roll of strong, but lightweight green wreath wire at the hardware store. I roll off enough for projects onto clothespins. The prongs of the pin help to hold the wire so that it doesn't slip. This is an easy way to handle the wire, without tangling it. A roll of wire about the size of a walnut is a good amount to start with.

When gathering the greens cut them in 8 to 12 in. pieces. If they are collected ahead of time store them in plastic sacks in a cool spot. You'll need bouquets of greens made up of three or four varieties for the wreath. A good arrangement can be made with spruce or white pine as the back or bottom piece and the cedar, and other bushier pieces on top.

Anchor the first bunch securely on a diagonal across the hanger hook (see illus. 5). When wrapping the stems, wrap the wire in a spiral fashion, rather than only in one spot. This keeps the bunch from flopping back and forth. Place each additional bunch of greens on the hanger, slightly overlapping the one before it (see illus. 6). The bunch must also turn out just a bit to form the circular shape of the wreath. Watch to see that the bunches overlap and turn out and also that they do not flop back and forth. Good overlapping will hide the wire and unsightly stems.

The wreath is finished when the last bunch is eased in behind the top of the first bunch. Be sure you've used enough bunches so that the bottom of each bunch is covered by the next one. Remember to think of the bunches as segments of a circle, placing them on the frame so that they are equal in size and distance.

These wreaths are not hard to make. Children in our 4-H club make them. Students in adult classes do them, and senior citizens make them. A little trial and error is necessary for some people before they catch on. Like any other skill or craft, wreathmaking is perfected through practice. Wreathmaking will make your holiday season one to remember and add a very warm personal touch to your decorations.

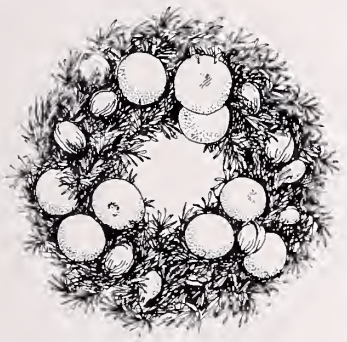
●

Lorraine Kiefer writes a weekly garden column for the *Franklin Township Sentinel*. She has been involved in 4-H work since childhood and has been a leader of a garden-craft-homemaking club for the past 10 years. A member of PHS for many years, she and her family entered the last three Harvest Shows. The family has a part-time nursery covering several acres of their property and they propagate their shrubs using mist beds.

Common and Botanical Names of Plants Used by Author for Wreaths

Garden Flowers	Method of Preserving
Baby's breath — *Gypsophila elegans*	hang to dry
Bells of Ireland — *Molucella laevis*	hang to dry
Chinese lantern plant — *Physalis alkekengi*	pick lantern when orange, hang to dry
Cockscomb — *Celosia argentea plumosa*	hang to dry
Globe amaranth — *Gomphrena globosa*	hang to dry
Honesty — *Lunaria annua*	pick seed pods or pennies when mature
Lavender — *Lavandula vera*	bloom or foliage — hang
Love-in-a-mist — *Nigella damascena*	pick pods after flowers are done
Origanum vulgare	hang, seed pods look best
Rosemary — *Rosemarinus officinalis*	hang
Statice — *Limonium sinuatum*	hang
Strawflower — *Helichrysum bracteatum*	pick before mature, hang to dry
Yarrow — *Achillea spp.*	hang to dry
Wild Plants to Use	
Bull thistle — *Cirsium vulgare*	pick before too mature, hang to dry
Evening primrose — *Oenothera biennis*	use seed pods found in late fall, winter
Goldenrod — *Solidago spp.*	pick before too mature, hang
Joe pye weed — *Eupatorium maculatum*	pick before too mature, hang to dry
Milkweed — *Asclepias spp.*	use pods after seeds are gone
Pearly everlasting — *Anaphalis margaritacea*	pick when in bud, hang to dry
Scarlet or highland sumac — *Rhus glabra* (this has red berry spikes, not to be confused with poison sumac, which has white berries)	use spikes of scarlet berries

18th Century Christmas Decorations for the 20th Century



by Betsy Kent

The social history of the 18th century goes beyond its period furniture and architectural styles. Precedents for the decorations, where the influence came from and how they were put together is a source of constant curiosity. Tradition appears to be more prevalent during Christmas than at any other time. Homes and places of worship have been decorated with evergreens from time immemorial. Boxwood, pine, bayberry, fir, ivy, cherry, laurel, aucuba and mistletoe are some of the evergreens we use to perpetuate this curiously pagan custom. There were no Christmas trees in the 18th century so it is quite possible that twining the ropes of evergreens around the stair rails and above mantlepieces played an important part in the rituals as well as being a focal point for the room. Mistletoe was used in doorways as a romantic yuletide symbol signaling the sentimental traditional kiss.

wreaths

During the 18th century we know that the life-like wood carvings of the 15th century sculptor Luca della Robbia influenced the public. He depicted fruits, fir cones, leaves and nuts in awesome detail. The wreath we traditionally make and use in Williamsburg is influenced by his artistry, and called a della Robbia wreath. Boxwood is the most common form of plant material for this type of wreath, although Korean holly may be used in areas where box is not available. Long needled pine may be used too but it does not give the bulk and weight box does. In the historic area of Williamsburg we emulate the customs that prevailed during colonial days. The wreath is a symbol of eternal life and had been used centuries ago by the Egyptians, Chinese, Hebrews and Romans. In making the della Robbia design we wire the fruit (no. 16 wire), cones and dried material that would have been at hand during the winter months, to the wreath. Okra, lotus pods and gumballs were ferreted away for such an occasion. Apples of all hues and lemons are secured to the wreath. Their pungent juices add to the final effect, combined with the rosin of the pine boughs and bayberry aromas. Although we know fruit was used in the 18th century, it is possible that it was not as abundant as it is today. It must have been a prized item brought to the colonies from the West Indies.

centerpieces

Flowers were never used as centerpieces for the dining table in the eighteenth century so epergnes are piled with nut meats, grapes, pippins, sweet meats and candied fruit. There is no

continued

question that items like a boar's head, with an apple in its mouth, and a sizable portion of venison were the center of interest. It would seem to be wasted space for any art other than culinary.

Today we do use a centerpiece called an apple cone which is in actuality a wooden cone form with nails all around it. The fruit is impaled on this. Although it is called an apple cone it can be made up in a variety of ways and is visually elegant or simple depending on how it is decorated. Without the cone for a base there is no other way to achieve this effect unless you pile the fruit, which is not only precarious but calls for the patience of Job. Assemble the cone where it will remain as it does not move well. You can use red, yellow or green apples, lemons, oranges, not-too-juicy pears or mixed fruit. Boxwood, holly or any small leaved evergreen may be inserted in open spaces between the fruit. The more plant material you use the better it looks. If it is made up too sparsely it does not have the good, full look it needs, and this is the most common mistake.

Kumquats may also be used in the spaces or with the base foliage. A double circle of magnolia leaves with one inch of the leaf and stem end off, arranged around the base give it added weight. If you work with red apples accent them with sprigs of holly that have good berry formation to bring out the reds. Tradition has it that pineapple goes on top for it is the sign of hospitality. However, the day of the small, delicate pineapple is gone and although they are featured in old prints the commercial pineapple of the twentieth century is too large and top-heavy for this spot. A handful of long needled pine twigs wired around the topmost nail make a more graceful composition.

This type of cone centerpiece is documented in the Dutch prints of the 1600's where mounds of cookies and fruits were arranged in pyramids on the tables. Pyramids were the style of the day and that influence came from the elaborate flower containers done in tiers that were tall, cone-like creations created for the wealthy class.

kissing balls

The kissing ball is used outside of the restored area in hotels and guest

continued

A colonial dining room's sideboard shows how the apple cones may be used in pairs to compliment each other, balanced with the knife boxes and tied into the table decoration of the same materials.

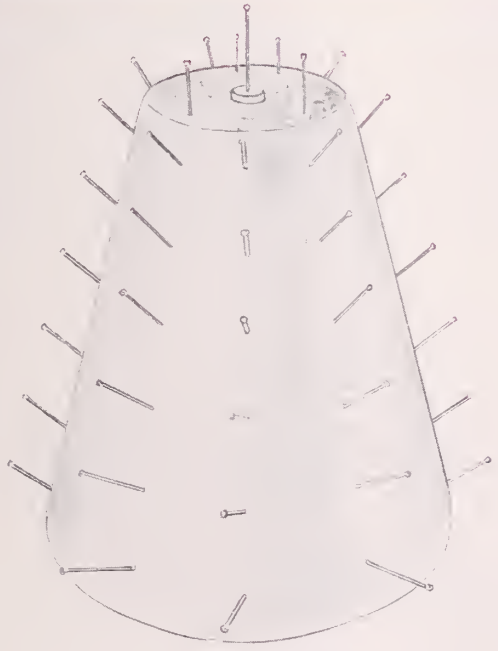
Wreath of pine cones, cotton seed hulls and Christmas berries

Slides supplied by Colonial Williamsburg Foundation

APPLE CONE

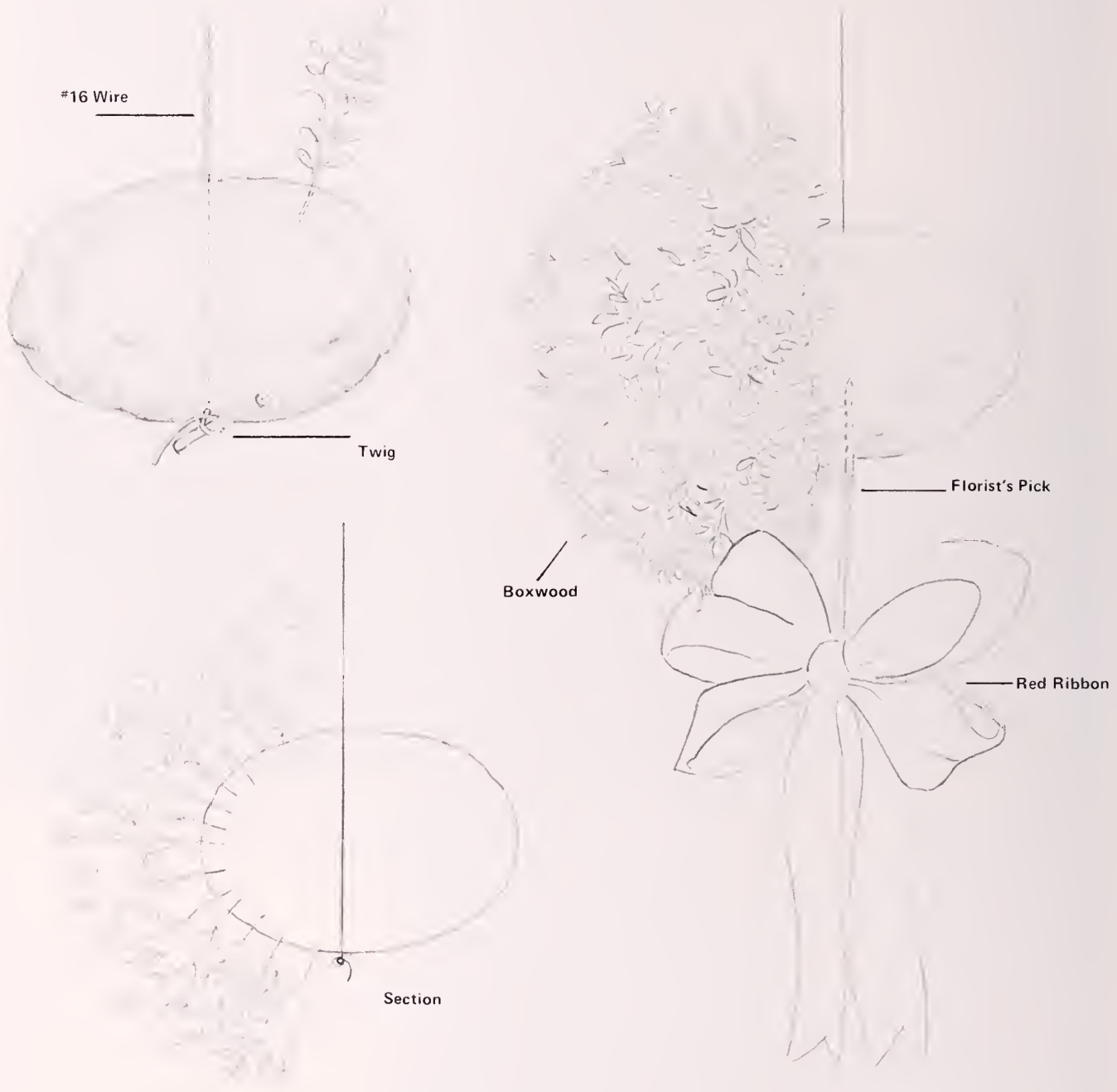
Apples are used here on the apple cone for an unpretentious centerpiece in one of the smaller restored homes. Boxwood and holly are used to fill in the holes between the fruit.

For information about buying apple cones write to Betsy Kent, 1031 Capitol Landing, Williamsburg, VA 23185.



drawing by Gerald Finn

KISSING BALL



drawings by Gerald Finn

houses, reminiscent of a later Victorian custom of a holiday bunch of evergreens tied with a red ribbon and mistletoe. Today it manifests itself as a different version of that; cheerful and easy to construct, it is for everybody to enjoy. Begin by sticking boxwood or Korean holly sprigs into a medium potato. You can later trim it to the desired size as box does not show the clip mark. Insert a wire through first, that is secured with a twig to anchor it. Streaming red ribbons may be added by way of a six-inch florist's pick. It may be used outside, hung from lamp posts where it can hang free. Inside it is often used in doorways.

This natural holiday expression is one of the most precious gifts to give and to receive, because of the time and care it takes to make. Whether you like to read about how to do it, look at pictures of the finished product or try it on your own, you run the risk of leaving the 20th century behind and completely enjoying yourself with some of the ideas that began traditions.

●

Betsy Kent is a free-lance horticultural writer based in Williamsburg, Virginia. She has had recent articles in *Horticulture, The Christian Science Monitor, Time-Life Garden Series* and *Antiques.*

HOLIDAY ARRANGEMENTS FROM NATURE

by Frances Balaban

From the time I was a small child I have loved collecting almost anything from nature. My greatest pleasure comes from growing, collecting and air drying flowers. I arrange mainly to use the large quantities of material I have dried, and since I am not primarily interested in arranging, my designs are easily made mass arrangements—ones that can be made by beginners.

Much of the plant material in the pictured arrangements was collected along the roadsides: *Pinus strobus* cones (white pine); *Dipsacus spp.* (teasel); *Rumex spp.* (dock); *Solidago spp.* (goldenrod) and a variety of grasses. *Achillea spp.* (yarrow), *Helichrysum brachteatum* (strawflower), *Gomphrena globosa* (glove amaranth), hydrangea, *Statice sinuata* and *Papaver spp.* (poppy pods) were garden grown. I bought the *Limonium tataricum* (German statice) and *Magnolia grandiflora* leaves.

mantel arrangement

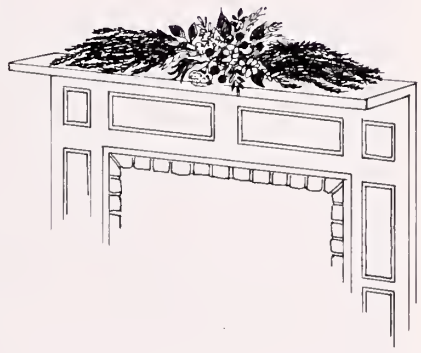
I made the mantel arrangement pictured here when someone asked me to duplicate simplicity and flowing lines of a well worn corn tassel swag. The same materials were not available at the time so I used dock as a replacement and created a design that provided the foundation for an easily modified seasonal arrangement.

The mechanics required for a 4-ft. long arrangement consist of a dowel ½ in. in diameter, 3 ft. long; a styrofoam block 1½ x 1½ x 3 in., wire and floral tape.

Insert the dowel horizontally through the center of styrofoam using a sharpened pencil to start hole, then move the block to the middle of the dowel forming the base for the arrangement. Working from the ends of the dowel to the center, wire to it lengths of dock approximately 1½ ft. long letting the tips extend about 6 in. beyond the ends. Continue overlapping lengths of dock using as many as needed to give desired fullness. Shorter lengths are used as you approach the center, leaving it free for the arrangement. Wire a suitable number of magnolia leaves to picks and insert into the perimeter of styrofoam forming a center approximately the size of a dinner plate. I completed the focal point by inserting into the block several pieces of golden yarrow, clusters of orange gomphrena, teasel picked in green stage, pine cones and a few sprigs of grass. See Fig. 5, page 23 and Fig. 1, below.

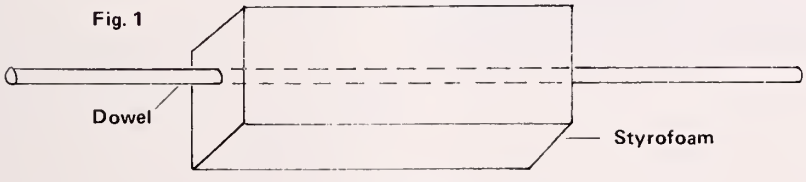
To change from the Thanksgiving theme to Christmas I replace the orange gomphrena with red and add a few white tallow berries.

continued



MANTEL ARRANGEMENT SUPPORT

Fig. 1



Dowel goes through styrofoam.

Fig. 2

photos by Samuel A. Balaban

basket arrangement

This arrangement is easy because abundant quantities of low cost materials are available and variations are unlimited. There are two parts to the project: the flowers are made from pine cones and teasel; second, the way the materials are arranged in the containers. See photo above and Fig. 3, p. 23.

Pine Cone Flowers (Fig. 4)

A. 1. With pruners or wire cutters, cut 2/3 off top of three large cones leaving 1/3 at stem end.

2. From base of top portion remove 8 or 9 scales to be used later as petals for teasel flowers.

3. Form stem for flower by wrapping wire around the bottom row of scales, twist and pull downward.

B. 1. Make stem end of the cone into a flower by repeating step 3. See Figs. 6 and 7, p. 24.

Teasel Flowers

A. 1. Cut three medium to large teasels across 1/3 from stem end. Set aside upper part to be used for B. See Fig. 8, p. 24.

2. Take remaining short bottom portion of teasel and cut into quarters lengthwide by inserting scissor point in center and cut down. See Fig. 9, p. 24.

3. Coat ends of tsuga (hemlock) cones or other small pods with glue and

Fig. 3

Basket — in three stages

Fig. 4

Pine cone and teasel flowers

press into center of quartered teasel.

B. Use previously cut top of teasel and pine cone scales to make second flower.

1. Glue a fake stem or wire into bottom of teasel.

2. Trim pine cone scales to equal lengths, dip cut ends into glue and force between spines at lower edge of teasel to form petals. Allow to dry in upright position.

C. 1. Partially cut the last teasel lengthwise into quarters and insert small cone as described before. This cone goes down into the teasel rather than protruding as in B.

I prefer a basket for the natural materials used here. Secure oasis in the container and completely cover it with short lengths of filler. Goldenrod, hydrangea or German statice may be used for this purpose.

I chose to make my arrangement symmetrical and did this by carefully placing the handmade flowers. I alternated the three teasel petaled flowers

continued

Fig. 5

Swag for mantel

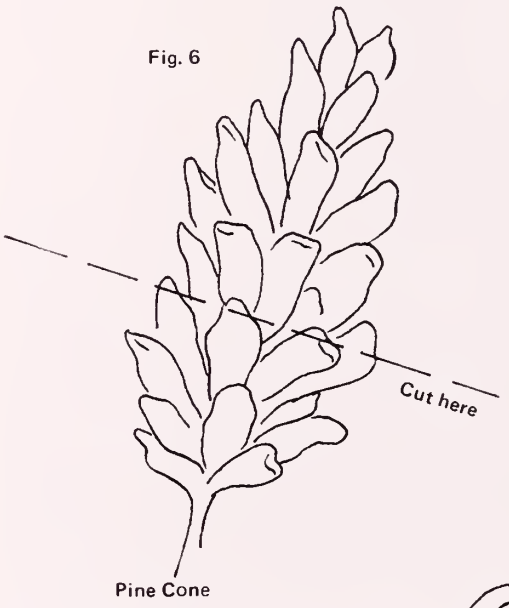


Fig. 6

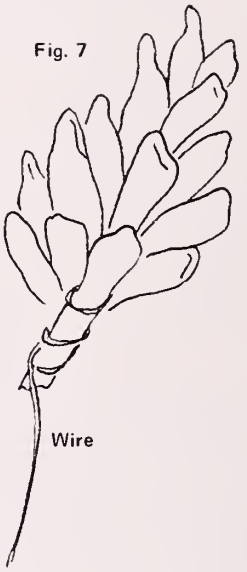


Fig. 7

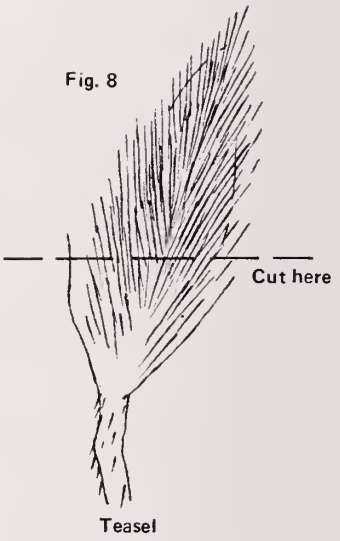


Fig. 8

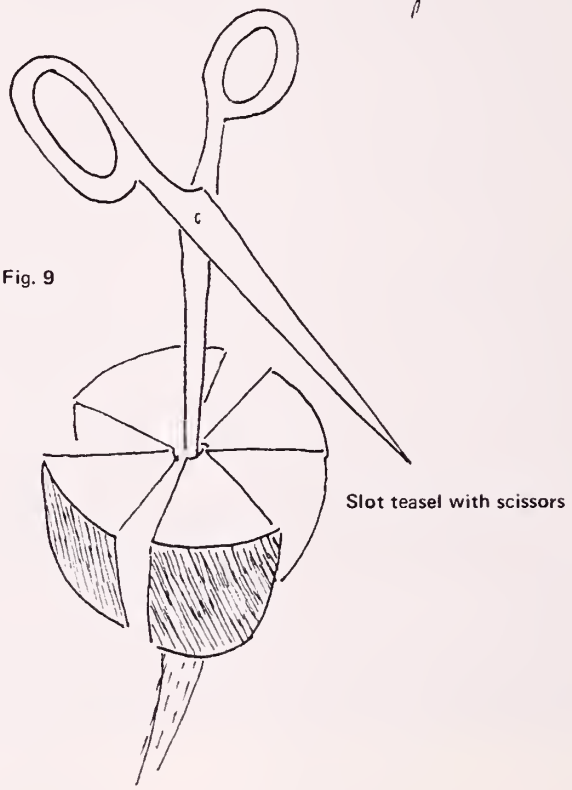


Fig. 9

Slot teasel with scissors

and the pine cone base flowers around the top edge of the basket, the large teasel flower went in at the top center. Next, the three smaller teasels and remaining pine cone tips were used for the middle row. Spikes of dock gave the arrangement depth. Separate the dock into lengths 3 to 4 in. and lengthen stems with wire. Place at random as many as necessary to give depth and fullness. After this basic arrangement has been made you can be as creative as you please.

For year-round use, to blend with the earth tones of today's decor, add shades of white to beige and interesting pods. Colored flowers, such as orange and red gomphrena, golden yarrow, strawflowers and berries may be added for a festive touch.

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Frances Balaban is a graduate of the Arboretum of the Barnes Foundation and is interested in many phases of horticulture. She has participated in the PHS Harvest Show and conducts workshops and flower arranging sessions using the dried material she has grown and collected.

GIFTS FOR THE ARMCHAIR GARDENER
books old and new

by Elizabeth Woodburn

Given a good book a gardener cannot complain of winter doldrums. Safely ensconced in an easy chair one can enjoy spring without frost, summer without heat or bugs, and dreams of the best garden ever created by the magic of the printed word. What better present than one that blooms variously and perpetually with gardeners' ideas shared through their writings. The literature of growing things is almost beyond cataloging, having come from the earliest times to the present. Good garden books remain valuable through the years as the basics of growing plants remain the same. The appeal of the recent garden book is the contemporary approach to seeing and using plants. Styles in gardens and styles in plants have their fads and fashions. A review of some of the recent books tells something of our current interests and approaches.

A well-chosen book can imply many things to the recipient: you consider the person intelligent enough to appreciate it; that they are capable of learning from it; it is a long-lasting reminder of your thoughtfulness. The reverse, however, can cause some less happy results. Don't give Aunt Agatha who has spent years creating a picture-book garden, an amateurish picture book. It will say all-too-plainly that you know very little about her or her garden and care less. It would be equally bad to give the novice struggling with her first bed of annuals a *Hortus III* to overwhelm and discourage her. Give her the picture book and the ABC instructions. The XYZ of annuals will do in a few years when she can readily identify the difference between an aster, a zinnia and the rest of the alphabet in between.

This past year has produced a variety of books with a range of subjects sufficient to intrigue almost any gardener on your list. The selections I have discussed here are unusual enough or are sufficiently different to have a special appeal to various types of gardeners.

For the gardener with an artist's eye, I can suggest two books. Henry Evans' *Botanical Prints* has 33 color plates from linocuts, 29 black and white. The text includes excerpts from his notebooks with an account of his techniques. Evans has a large following. This volume qualifies as a collector's item and will delight those who admire his work.

Since Iran is the cradle for many of our most beautiful bulbous plants it is startling to find what we have overlooked.

A reflective and beautiful book appealing to any artist or nature lover brings together two excellent people. Hal Borland's *The Golden Circle* is exquisitely illustrated by Anne Ophelia Dowden. Twelve of Hal Borland's essays, one for each month, are accompanied by 12 of Dowden's color plates depicting flowers of the season. For those who collect books illustrated by Dowden this book will be another delight.

A work that illustrates one of the most popular forms of 19th century horticultural color plates has been acclaimed for its recognition of this art form. Its well-written text describes the part these color illustrations played in the developing nursery industry. Charles van Ravenswaay's *A Nineteenth Century Garden* explains the popularity of the 19th Century seed catalog and the important part it played in the development of the gardens of the time. The 24 plates, 12 of which are in color, amply illustrate the text and show why the plates had such appeal in a day before the mass production of color printing. With our increased awareness of the importance of the seed and nursery catalog as a prime source of information about the 19th century gardens, this work, the only one on the subject, not only provides visual pleasure, it gives considerable information on a subject largely ignored heretofore. The fact that it is paperbound with an attractive color plate on the cover makes it easily the best buy for any season.

A very different form of illustration is shown in Frank J. Anderson's *Illustrated History of the Herbals.* The appeal of herbals is so wide that almost any gardener can find some facet of personal interest in the history of these oldest books on plants. Anderson has ranged widely in selecting the 110 examples from the early herbals. Not only do they show the developing medium of book illustration, they are graphic examples of the growth of the scientific approach to plants.

A different type of herbal interest is covered by a beautiful reproduction of *The Medieval Health Handbook, Tacuinum Sanitatis,* which is accompanied by a translation from the Italian. It is an early codice of Liege and Rouen,

continued

Rose, *Rosa* hybrid from *Botanical Prints* by Henry Evans, W. H. Freeman and Company. Copyright © 1977.

which is reproduced with 48 fine color and 238 black and white illustrations. This is a book to give to someone with a real appreciation of early medical uses of plants as well as an appreciation of an attractively printed book.

For gardeners of the Delaware Valley interested in preserving the heritage of native plants, Bebe Miles has written *Wildflower Perennials for Your Garden.* This book is especially welcome because the author describes fully our local conditions.

Green Magic: Flowers, Plants and Herbs in Lore and Legend by Leslie Gordon is a wonderful blend of superstitions, legends, and amusing ideas that have grown up around various plants over the centuries. It is full of the "bits and pieces" that are fun to repeat and show the great amount of research which has gone into the book.

For anyone interested in the history of gardens a delightful introduction to the subject is offered in *The Pleasure Garden.* Anne Scott-James (author of the popular *Sissinghurst, The Making of A Garden)* and her husband, Osbert Lancaster, collaborated to produce a light-hearted series of essays about various gardens from the Romans to the present. Each essay is illustrated by one of Lancaster's amusing drawings of his interpretation of period gardens.

For the serious grower of exotic plants few presents would be more welcome than the new 1125-page *Tropica: Color Cyclopedia of Exotic Plants and Trees from the Tropics and Subtropics* by Alfred Byrd Graf. Filled with 7,000 color illustrations, *Tropica* is the answer to those who wanted *Exotica* in color. In addition to the 7,000 color plates it also provides the information about the plants themselves with which Mr. Graf is so familiar.

With more people and less room all the time, a really good book such as John Brooks' *The Small Garden* has a serious contribution to make. This large work is lavishly illustrated with color plates, plans and line drawings as well as maps of climate patterns, microclimate study and a store of helpful ideas such as one would expect from the author of *Room Outside.*

For the rhododendron and azalea enthusiast there is an excellent new work that is unique. *Hybrids and Hybridizers: Rhododendrons & Azaleas for Eastern North America* edited by Philip A. Livingston and Franklin H. West (both PHS members) combines a study of plants and the famous people who produced them. The fine plants resulting from years of patient experiment are pictured here in color and black and white. The staggering amount of work that the hybridizers put into producing these plants chronicles the dedication they have to an ideal. Most gardeners little realize the background behind the new hybrids they buy. The study of these men's lives is fascinating reading.

. . . shop early so you'll have time to read the book before you give it away.

Sheila MacQueen's *Flower Arranging* pictures the English style of flower arranging with effects providing new approaches to the challenging project of home decoration. Since flower arranging is a continuing project, new ideas are stimulating to encounter.

A book from the Ariamehr Botanical Garden in Iran is among the more fascinating slim volumes to appear on the garden horizon. *Tulips and Irises of Iran and Their Relatives* by Per Wendelbo has 84 color photos of plants that are little known here. Since this part of the world is the cradle for many of our most beautiful bulbous plants it is startling to find what we have overlooked. The text provides brief descriptions of the flowers and gives habitat and growing conditions. Many of the photos show the plants in their natural surroundings.

A final selection for the plant specialist combines both information and lovely illustrations. Alice M. Clark's *Begonia Portraits* contains 41 of her color plates and 26 black and white sketches with opposing pages of description. Originally these appeared in *The Begonian* from 1943 to 1949 and now are available in this more permanent form in a limited edition privately published. Clark's knowledge of the begonias she grew and her affection for their subtle differences and varieties is obvious from her lovely portraits.

This sampling, showing the diversity of today's books, proves that the horticultural field is alive with new ideas for the use of plants. Share in the horizons these books provide for a more interesting horticultural tomorrow. A recommendation — all of these books are available at PHS's library. You can either check on the appropriateness of the book as a gift, or shop early so you'll have time to read the book before you give it away.

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Elizabeth Woodburn is a New Jersey bookseller who specializes in books about horticulture and beverages. She serves on the PHS Library Committee and is a library consultant in the horticultural field. Ms. Woodburn is secretary of the Antiquarian Booksellers of America.

Hyacinths, Straight-up

by Bebe Miles

Having some deliciously-scented flowers this winter can be almost as easy as filling a glass with water. This technique is a special boon for city dwellers who do not have easy access to soil. Since the process takes a minimum of about 10 weeks, there is no time to lose, however.

Your first requisite is some top-size hyacinth bulbs. They are available at garden centers and even supermarkets as well as mail order in a variety of colors. My personal favorite is L'Innocence, a pure white with lovely perfume, but you can find others in many shades of blue as well as yellow, rose and pink. Some bulb suppliers have double-flowered hyacinths, too, and they are quite eye-catching.

Special hyacinth glasses retail for under $3 usually, and they can be used year after year. You can fashion your own container too. Simply bend two wires as in the illustration. Place wires at right angles on a tumbler wide enough to contain the hyacinth bulb. (A glass intended for old-fashioneds is ideal.)

Make sure the base of the bulb is clean of any old roots or dirt, then place it atop the wire basket or in the top half of the hyacinth glass. Fill the container with water until it just reaches the base of the bulb. A small piece of charcoal added to the water insures its staying sweet. To guard against rot, never add water higher than the bulb's base.

Now you must patiently play a waiting game. Put the container in as cool a spot as you can (but not where it will freeze). Then cover it completely to keep out all light. A heavy paper bag or a small box works equally well. Make sure the cover you choose is at least 6 in. higher than the container so the shoot has room to grow.

Gradually the bulb will produce white roots in the water half of the glass and a shoot at its top. You may have to add small quantities of water in the beginning to keep the liquid level just at the base of the bulb. After the roots elongate, the need for extra water checks lessens.

The waiting period ends when the water is filled with roots and the shoot has grown to about 4 in. This growing phase lasts about eight weeks. It corresponds to the time that hyacinths in the garden are putting out roots under the frost.

Even if the shoot begins to elongate, wait out your eight weeks until the root system is a good one. Sometimes at the end of that time you'll have good roots, but the shoot is barely out of the bulb. In that case give it another week or two, for you want the flowers to open on a stem at least long enough for all of them to be shown off.

Once the shoot has reached about 4 in. in length, you're ready for the next step. Your shoot will be a sickly yellow color from lack of light, just as it is under soil in the garden. If you put it directly into bright sunlight, it may well burn. Instead, expose it gradually. The first day simply remove it from cover to a dark corner. Then over a stretch of several days move it toward a north window in as cool a room as you have.

Before long, you'll be seeing the first buds open, and the delightful scent of hyacinths will fill the room. To keep the blossoms in good condition as long as possible, I move the glass from the window during the time the flower is out. Don't put it near any heat source, incidentally. Mine go sometimes in the middle of the dining room table, other times on a coffee table in the living room where as many of us as possible can enjoy this promise of spring to come. During flowering I also try to remember to take the glass from the warmer room to a cooler spot each night.

Once blooming is over, cut the flower stalk off neatly and place the glass in a sunny window to encourage the foliage to grow. I add a weak solution of plant food to the water too. So treated, your hyacinth bulb can be planted in the garden come spring. It probably will wait a year before it blooms again, but after a while you'll have a bonus from your winter experiment. If you're an apartment dweller without friends in the country, discard the bulb after flowering. It will not force a second year.

Like other hardy bulbs, hyacinths can also be grown in pots of soil, and they adapt well to being grown in pebbles just as you might treat paper

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Bebe Miles is an author of four books and a frequent contributor to *Green Scene*.

white narcissus. The water glass technique, however, is so wonderfully easy. If you opt for the double-flowered forms of hyacinth, it's not a bad idea to fill the bottom of the container about a third full of pebbles before adding the water so the heavy double spikes don't tip. A good root system anchored in pebbles helps prevent this catastrophe.

One postscript: you can keep the bulbs in their cool, dark spot longer than described above. So if you start several containers, take only the first one out in the beginning. A week or 10 days later start the second on its trip to the light. That way you can decorate your winter quarters with hyacinths for the longest possible period. I can almost guarantee that next year you'll double the number of bulbs you put into production.

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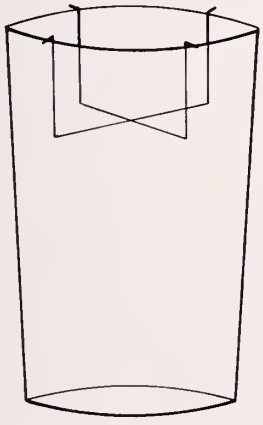

A homemade hyacinth glass is fashioned from two wires bent and crossed inside an ordinary drinking glass.

drawing by Victoria Smith

photo by author

This hyacinth is not yet ready to bring out of its cool, dark forcing spot. There should be more roots, and the shoot should be twice as long as shown here. Trying to hurry flowering is a mistake.

snow
friend or foe

by Ed Lindemann

I like to see snow on the top of some mountain in June, when I go there to find it, but in my garden I can very well live without it; for even on the dullest of winter days there is always some stem or bud that is worth looking at or some job that wants doing.

—E. A. Bowles, *My Garden in Autumn and Winter*

Edward Augustus Bowles was an Englishman; perhaps if he had gardened in the Northeastern United States he would have felt slightly different for our sometimes friend, sometimes foe, commonly known as snow.

On the other hand, I'm a snow freak. Each fall I wait for the first predictions of flurries and become ecstatic when there are threats of a three-day blizzard. I run from window to window checking wind direction and sky color and get up regularly throughout the night turning on flood lights to check the accumulation. Very strange for a gardener, you say. Not really. It's just that when it comes to gardening I firmly believe that you will be less frustrated, more successful and therefore happier if you work with what you have and make the best of each situation. Don't always be trying to fool Mother Nature. It is a fact that in the Delaware Valley we have a seven month period when it is possible to have snow from flurries to 40 in. We can't stop it; we must live with it. As with any relationship the key to success is understanding. Let's think a little bit about the benefits and disadvantages of snow.

First of all snow is just plain pretty to look at. That's a benefit, and when I plan a garden I am very conscious of what the garden will look like for more than half of the year when it is not in bloom or growing and what it will look like under snow cover. Plants large and small, deciduous and evergreen all take on a different personality in the snow. Walls, fences, sculpture and garden structures are softened. Colors change, spruce, pine and rhododendron often take on a steel blue or gray different from their normal green hues. Red twig dogwood and mottled crape myrtle stems that have gone unnoticed during the growing season now become features in the landscape especially when backed by a blanket of white. All of the benefits of snow are not strictly aesthetic. Snow is one of the best mulches a gardener can have, and I envy

gardeners in New England who have a more constant snow cover that they can rely on. Bulb and perennial plantings thrive under a snow mulch where they remain at a more even temperature and do not dry out or heave as much as unprotected beds. The same is true for many shallow rooted shrubs such as azaleas, rhododendron and box. Many gardeners claim that it is best to apply seed, lime and fertilizer on top of a late spring snowfall because the melting snow will carry the seed and nutrients into the soil. While I don't argue this point, I prefer to wait until the last snow has passed before starting spring lawn renovations.

Winter is coming and so is the snow. You may love it or you may hate it, but there is no way of stopping it.

Along with snow's beauty and its advantages of providing a good mulch and supply of moisture it also brings problems. When snow prevents rabbits, mice and other rodents from feeding off the surface of the land, they take to girdling the trunks of trees and shrubs. You can best protect your valuable specimens with a collar of hardware cloth that extends to a height above the normal snow line. The protective collar will also prevent rodent damage under the snow where mice often burrow and feed on the bark of tree trunks.

sun reflector

That blanket of white that forms the perfect backdrop for the various color and textural interests of nature also forms the perfect reflector for the sun. Damage from reflected sunlight is not limited just to broadleaf evergreens as many people think. Sunscald, winterburn and other light related injury can occur on needle leaf evergreens and the tender bark of young deciduous material. Wrapping the trunks of young trees with tree wrap paper the first few years will prevent cracking and splitting, which weakens the tree. Removing the snow from under and around evergreens, while time consuming and difficult, reduces the problem of sunscald. Scattering sand or the ashes from your fireplace will reduce the glare, and the dark color will absorb heat and melt the snow faster.

Anyone who has shoveled a walk knows that snow is heavy. In the Delaware Valley we get a lot of heavy wet snow storms that twist, bend and mutilate many of our ornamentals including birch, arborvitae and box.

Following every one of these storms the PHS Hot Line is flooded with calls from people who are concerned for the safety of their plants. If the snowfall has been a light dry one it is safe to very gently tap the heavily loaded branches from underneath with a broom or mop handle. Do this only if the snow is fluffy and falls freely. Work from the bottom up to prevent the accumulation of additional snow on the lower limbs.

There are other precautions that can be taken to reduce the snow damage problems. First, choose the proper plant material. If possible try not to use material that you have noticed to be particularly subject to snow damage in your area. Study the snowfalls; most properties take on snow patterns, windswept bare areas in one location and high drifts in another only several feet away. Placement is important, avoid locating plants under the edges of eaves where they are bound to catch sliding snow and ice as it falls from the roof. Use strong rigid material for hedges and screens that are out in the open rather than weak floppy plants that bend or snap under stress. Upright forms of taxus or ilex survive better than soft feathery arborvitae or open spreading Pfitzer juniper. Since I like arborvitae for a hedge or screen planting in the proper location there are a few solutions to the problem that are worth mentioning. Wide spreading plants including boxwood can be firmly but not tightly wrapped in cages of chicken wire. Hedges can be lined rather than wrapped. The chicken wire supports the plants, yet it is practically invisible, acting much the same way a hairnet does. Dark green string or twine can be gently wrapped around evergreen specimens. Twine attached to evenly spaced stakes on both sides of tall hedges will act as cribsides and prevent the plants from collapsing under snow and ice.

Heavy horizontal branches that cantilever over other plants and stand the chance of crashing down with added weight should be propped up to prevent such accidents from occurring. Try using old tree trunks or branches especially with the bark still intact; they look more natural than raw two by fours from the lumber yard. Have large specimen trees checked by a competent arborist. Wiring, cables, trusses and other means of support are expensive, but they may prevent thousands of dollars worth of damage to buildings and other plants.

Winter is coming and so is the snow. You may love it or you may hate it, but there is no way of stopping it. Study your garden and be aware of potential snow damage. Take some precautions now. It's too late when the flakes have fallen and the boxwood is split in half, the birch has bent into a perfect arc and that big limb on the locust has just come crashing down bringing with it the electrical and telephone lines leaving you stranded with nothing but a freezer full of thawing food and no electric stove to cook it on. Remember, fresh snow is just plain pretty to look at.

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PLANT IDENTIFICATION
a botanist talks to gardeners

A good botanist or taxonomist can identify perhaps 3,000 plants on sight —at present there are approximately 300,000 known species of plants. Known species—that means species that are described botanically in a book or paper, and that are filed in an herbarium somewhere in the world. An herbarium is a collection of plants that have been preserved by pressing and drying for the purpose of study and future reference.

Each known plant has at least two Latin names. Its "last" name, corresponding to a surname, is the generic (genus) name and is given first and capitalized. Its specific (species) name is given second. Further names are sometimes added to designate varieties or forms of the particular species. Take our native dogwood, for example—*Cornus florida* is the common flowering dogwood; *Cornus canadensis* is the bunchberry; *Cornus alternifolia* is the alternate-leaved dogwood; *Cornus stolonifera* is the red osier or red-twig dogwood. *Cornus florida* forma *rubra* is the wild pink dogwood; *Cornus florida* cv. Cherokee Chief is a cultivar of the *rubra* form, and may be designated by nurserymen as Dogwood 'Cherokee Chief.' This last is legitimate because it saves space and printing costs, and the common name "dogwood" is unmistakable, not applied to any other genus of plants. (If you look up the word "dogwood" in the dictionary, you may find another genus, *Cynoxylon,* but that is an obsolete name for *Cornus.)*

Another type of name is *Cornus drummondi,** *drummondi* being a Latinized version of Drummond, a person for whom that species was named. Many plant names, both generic and specific, are Latinized versions of more or less recognizable people's names. Specific names that are capitalized almost invariably are Latinized proper names. Knowing that is an aid to pronouncing some of them.

All of these plants are classified in the genus *Cornus,* same as you would say all the Joneses are in the Jones family. There is even a "family" resemblance as you can see by the illustration, only in plants it is a generic resemblance and the word "family" is used for groups of like genera. (See drawing on top of page 33.)

how plants are classified

A long time ago, when curious men like Aristotle were roaming around looking at things without benefit of microscopes or motor cars, classification of plants was simple: trees, shrubs, vines, forbs—"forbs" being a nice short name for herbaceous plants. This classification may sound familiar to you—it's used today by nursery catalogs. Their plant listings are broken into sections —trees, shrubs, hedges, evergreens, etc., and within their section the plants are placed in alphabetical order. If you know at least the common name of the plant you are looking for, you can find it in the index. If you know only that it is a hedge plant, you can leaf through that section in the hope of finding its picture, and, in the better catalogs, its botanical name. Catalogs can be very handy in the identification of cultivated plants—but check the spelling of the botanical names.

I identified pennyroyal after I became a botanist because I recognized the fragrance of what my grandmother used to rub on my arms and legs to repel mosquitoes, and she called it pennyroyal.

Another basis for plant classification for identification purposes is color of flower. This is used in several guides to wildflowers. Another basis is alphabetical, as in encyclopedias, but you need to know the name of the plant before you can look it up in an encyclopedia, and finding out the name is what this article is about.

The basis for classification in botanical books is the anatomy of the plants, especially the anatomy of their flowers. The order in which they are listed is based on Evolution—with a capital E —from lower to higher plants, but since it is a matter of theory and conjecture how different anatomical features evolved from other more primitive anatomical features, you will find that the exact sequence changes from book to book and is still being changed as new books are published. What you need to know is how to use the key to the book, and what anatomical information to gather from the plant you are trying to identify. As you go along, you learn the knack of reading botanical descriptions.

Now, what a key is and how to use one can be explained, but first let me say that the key to a book, no matter how all-encompassing the book, will identify only the plants that are listed in that book. Especially with cultivated plants, you may have to do a bit of detective work to find out which book the plant is listed in, and in the process of this detective work you may find out enough about the plant to lead you directly to its name which can then be found in the index of a book.

detective work

Your first piece of detective work will be to decide (or deduce) whether the plant is a wild or native specimen, or a horticultural or cultivated specimen. That's easy, because any wild plant that is being used as an ornamental or horticultural subject in a garden or park is usually known to your host, or guide, or it is labeled. Other than these, wild plants are ones that you have seen in woods or along roadsides, or ones that have suddenly grown up in your garden; and horticultural plants are ones that you have seen cultivated in gardens, nurseries, or greenhouses.

Your next step is to gather any information you can about the plant. You started with where it was growing; note next whether it has any flowers or fruit on it—time of blooming or fruiting is important. Certain small greenish

*This specific name is more often seen as *Drummondii,* but caps and double i's are being eliminated on specific names in botanical nomenclature.

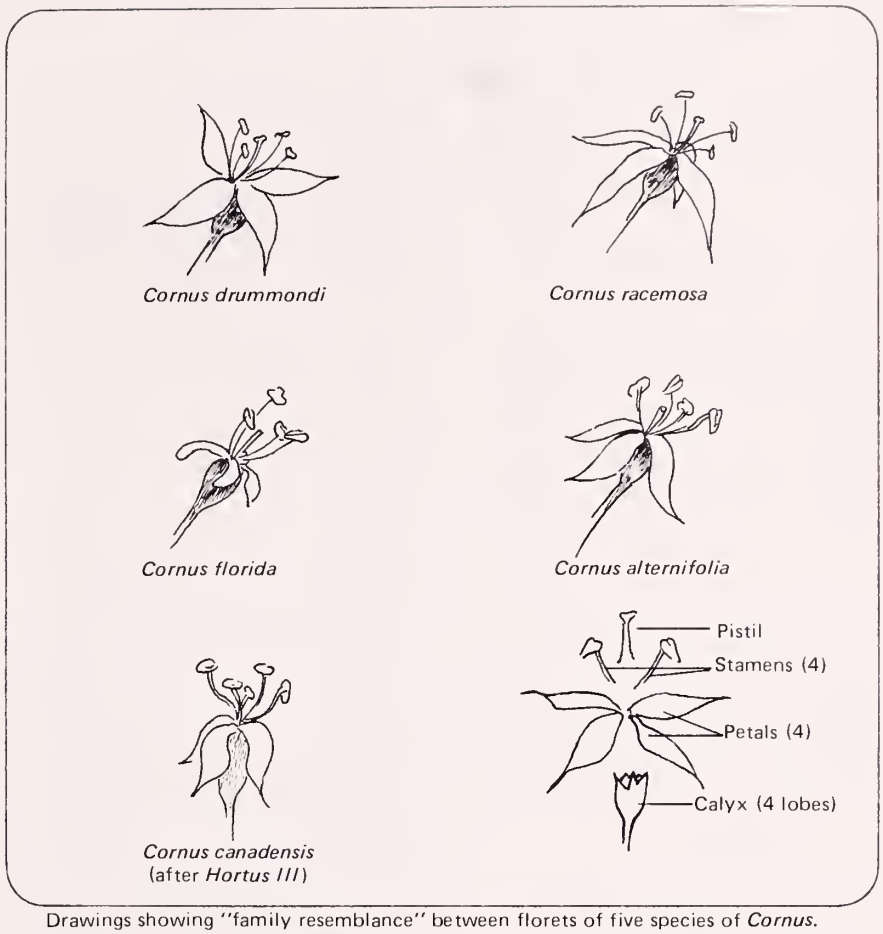
by Emily Kneebone

flowers may not be obvious—look carefully and notice any kind of structure on the plant that is not leaflike, or not shaped like the rest of the leaves. The color, size and shape of either the flower or fruit should be jotted down. The size and shape of the leaves, degree of hairiness, and any unusual leaf color such as gray-green should be noted. Stems should be marked as woody or herbaceous. Approximate height of the whole plant and habit of growth (upright, vining, or trailing) are clues to its identity also. Observe whether it is growing in shade or sun, or among rocks, in shallow water, or any other habitat that seems unusual. If it reminds you of a plant somewhere else that you are familiar with, put that information in with your list of clues. A botanist friend of mine once identified a plant before the specimen arrived in the mail because the man told her on the phone that it was growing on the beach and it reminded him of bluebells *(Mertensia virginica)*. She looked up *Mertensia* in a botany book and found that there is a species of the genus that grows on beaches—*Mertensia maritima*.

If your plant is part of a landscaping plan outside a public building or shopping mall, you can try to find its duplicate in a nursery that specializes in landscaping, or in a library book on landscaping.

One of my favorite clues is a common name. I identified pennyroyal after I became a botanist because I recognized the fragrance of what my grandmother used to rub on my arms and legs to repel mosquitoes, and she called it pennyroyal. All I had to do was look up "pennyroyal" in the common-names index of Gray's *Manual of Botany* (8th ed.), and I had the botanical name, *Hedeoma pulegioides*. Being a botanist, I realized that the fragrance of the plant plus the common name that I remembered from my childhood would lead to a quicker identification than going through the

continued



art by author

Drawings showing "family resemblance" between florets of five species of *Cornus*.

art by J. Baxendell from author's concept

botanical key to the mint family *(Labiatae),* which is one of the most difficult of keys because it depends greatly on microscopic anatomical differences in the flowers of the different species.

Common names have a terrible reputation among botanists, and it is true that they are not exact as are the Latin names. But I have found that even a non-botanist, non-gardening friend can give me a good clue to the identity of a plant by remembering something she thought she might have heard somebody call it. A great many of our present scientific names *(Cornus,* for instance) are nothing more than the ancient common name of the same plant. It is also noticeable that the common name is frequently a translation of the Latin name. *(Cornus alternifolia* — alternate-leaved dogwood.) And common names of plants can be looked up in that most accessible of books, the dictionary, with a surprisingly high degree of success in finding them.

keys: a last resort

You may have detected by now that even a botanist uses a key only as a last resort. Difficulties with keys, besides the one already mentioned of microscopic differences, have to do with finding a book in which the plant is listed without knowing the name of the plant. One has to go to a category such as "house plants" or "tropical ferns" for greenhouse specimens, and hope that this particular plant *might* be listed there.

Here is a bit of detective work that I did not long ago: In a commercial greenhouse, I asked a worker what a certain interesting-looking-but-unlabeled plant might be. He scratched his head and said it began with *A* and he thought it might be "arcaria." I knew immediately that he meant *Araucaria* which is the Norfolk Island pine, and I knew it was not that plant. But on a hunch I went to the index of my house plant book and looked at the A's. *Ardisia* was the next one to *Araucaria* in the index, and after reading its description, I knew, sure enough, that was the name of the plant I saw.

Remember also that one of the best and easiest ways to identify plants is to find someone who knows it on sight. When you can't determine what the plant is, submit your clues and a dried specimen of the plant, if that is possible, to your local extension office, park, arboretum, horticultural society or gardening magazine (if they have someone who handles these questions). Chances are that it is one of the 3,000 species and that someone there can identify it on sight. The reason for this is, that in any one locality, at any one time, there are only a dozen or less species in bloom or noticeable for some other reason. Even if your plant is not blooming, the chances are good that it is easily recognizable to an expert because of the clues you have provided, and because of the limited number of plants that answer such a description in any one locality at any one time. That is the real secret of quick plant identification. If you can stop discouraging yourself by thinking in terms of 300,000 possibilities and realize that your number of choices is really quite limited, then the prospect of learning how to use keys and how to read botanical descriptions becomes less grim. And one of the best ways to learn how to use keys is to take plant names that you know already and follow them through a key.

[Ed. Note: Emily Kneebone has prepared a second part to this article, which will show the reader how to use a key. Part II will appear in the January issue of *Green Scene.*]

●

Emily Kneebone has a B.S. in botany from the University of Maryland. She is chair of the herbarium at Cylburn Wildflower Preserve and Garden Center in Baltimore and is second vice president of the Horticultural Society of Maryland. She is also an instructor in gardening and botanical subjects for the Bureau of Recreation of Baltimore. She notes that she is a member of the Camellia, Daffodil and Cactus & Succlent societies of Maryland, and her greatest preoccupation at the moment is getting her last three seeds of *Ruscus aculeatus* (butcher's broom or box holly) to sprout.

Statement of Ownership Management and Circulation (Act of October 23, 1962; Section 4369, Title 39, United States Code).

1. Date of Filing: September 25, 1978. 2. Title of Publication: *The Green Scene.* 3. Frequency of Issue: bimonthly. 4-5. Location of Known Office of Publication and Headquarters: 325 Walnut Street, Philadelphia, Pa. 19106. 6. Names and Addresses of Publisher and Editor: Publisher — Pennsylvania Horticultural Society, Philadelphia, Pa. 19106; Editor — Jean Byrne, 325 Walnut Street, Philadelphia, Pa. 19106.7. Owner: The Pennsylvania Horticultural Society, Philadelphia, Pa. 19106. 8. Known bondholders, mortgages and other security holders holding one percent or more of total amount of bonds, mortgages or other securities: None. 9. Extent and Nature of Circulation:

	Average No. Copies Each Issue During Preceding 12 Mos.	Single Issue Nearest to Filing Date
A. Total No. Copies Printed (net press run)	7,550	7,800
B. Paid Circulation		
Sales through dealers and carriers, street vendors and counter sales.	101	92
Mail subscriptions	7,297	7,477
C. Total Paid Circulation	7,398	7,569
D. Free Distribution (including samples) by Mail, Carrier, or other menas	70	70
E. Total Distribution (sum of C and D)	7,468	7,639
F. Office Use. Left-Over, Unaccounted, Spoiled after Printing	82	161
G. Total (sum E and F should equal net press run in A)	7,550	7,800

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Jean Byrne, Editor

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Albert Webb peers from his bamboo sun pit.
See story on page 3.

THE green scene

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Flower arranging a la Carte.
See page 3.

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THE green scene

HORTICULTURE IN THE DELAWARE VALLEY

Volume 7, Number 3 Jan./Feb. 1979

published by
THE PENNSYLVANIA
HORTICULTURAL SOCIETY
325 Walnut Street, Philadelphia, Pa. 19106

THE GREEN SCENE, (USPS 955580) Volume 7, No. 3, published bimonthly, January, March, May, July, September, November, by the Pennsylvania Horticultural Society, a non-profit membership organization at 325 Walnut Street, Philadelphia, PA 19106. Subscription: $7.50 — Single Copy: $1.50. Second class postage paid at Philadelphia, PA 19104.

POSTMASTER: Send Form No. 3579 to THE GREEN SCENE, 325 Walnut Street, Philadelphia, Pa. 19106.

in this issue

Front Cover: Jean Carte crosses Rittenhouse Square on her way to the Commissary. See page 3.
photo by Edmund B. Gilchrist, Jr.

Back Cover: photo by Barbara Bruno

FLOWER ARRANGING A LA CARTE

by Jean Carte

Free-lancer Jean Carte designs arrangements for several Center City restaurants.

I had been working as a free-lance interior landscaper for two years before I had considered commercial flowers. The decision had come quite accidentally while working on one of my accounts. Steven Poses, the owner of the Frog and The Commissary restaurants, approached me about arranging the flowers in the restaurants; until then he had been doing them himself. Seeing the numerous and more uncommon species of flowers he used so sensitively, convinced me that it was an account I would enjoy taking on.

My only previous experience had been arranging the wildflowers that grew in abundance around my parents' home in the Poconos. When it came to stalking the wildflower, my mother and I were accomplished. We would swoop down on fields and byways gathering Queen Anne's lace, black-eyed Susans and wild dill by the armful. It was an exciting beginning and has had a strong influence on my designs even today.

My flower business, which goes under the name Plant Services, has grown to include weddings, dinners and other events. I enjoy working and communicating with the many different people I come in contact with. It is really a challenge to take an order and try to create something that will please the client and yet still be an expression of myself.

I usually buy all my flowers at the Savoy Steak Shoppe on south 18th Street. Connoisseurs have known of this food specialty shop for years, with its large year-round selection of fresh cut flowers. They will order anything from Rothchild lilies to alliums. When the first lilacs are blooming, you can be sure to find them at the Savoy. This shop is a great find for Center City flower enthusiasts.

I find that there are two things that make my designs different, one is the boldness of color in my arrangement, and the second is the number of species I use. Some choices of materials seem to dictate simplicity, while another color scheme virtually shouts for expression. One day I may use cock's comb, baby's breath, bakers fern and laurel in a copper pot, while the next week, I'll use marigolds, mid-century lilies, red roses, a few daisies, and some goldenrod with that same cock's comb in that copper pot.

I have always found working with flowers very tranquilizing. No matter how late, or how hurried I am, once I begin to work, I have no sense of time and soon lose myself completely.

I think most people fall short when trying to arrange because they flounder and grope for some sort of guideline or set of rules to follow. I simply follow the proportions of vase to flowers, choose a compositional focus, be it a special flower, or color theme, and use accents for contrast. I learned an important lesson that I still must remind myself of, since I do tend to work too densely: the space between flowers is just as important as the flowers themselves.

Unfortunately most restaurants use flower arrangements to fill up those negative holes, and to cover those light switches. Rarely do I get a chance to display an arrangement as it should be shown. The few that are well placed do deliver quite a visual punch and are certainly the ones that people will remember. When I finish with one and place it, I like to stand back and watch people's reactions as they pass by.

Commercial designing does have many pitfalls when it comes to keeping those arrangements fresh looking for a week. When working on weddings or banquets, the flowers only have to look good for a few hours, so I can wire and use picks to obtain a special effect. Otherwise, you find yourself battling against heavy traffic areas where the flowers get bumped or fingered constantly by hundreds of people a day. Smoke and heat from cooking areas, added to drafts and hot lights, will rob days from the life of an arrangement. Many a Sunday night my phone has rung with a frantic hostess telling a sad story of wilted zinnias or roses that simply aren't going to make it until Tuesday. It's difficult to keep regular hours when it comes to something as fragile as a cut flower.

I usually work right on a job location, so it is difficult to properly fix all flowers. For this reason I usually try to stay away from anything that has to be flame treated, or boiled. I find if I change the water twice a week, reclip ends, use new oasis, along with strong doses of flower preservative, I get good results. Even so, many times I will use a flower I know may not last because I couldn't resist it at the market. First flowers of the season, or forced flowers seem especially delicate and not very reliable, although, I must say, nothing is more exciting after a long cold winter than those first freesias and tulips from Holland; they are so special.

My search for new ideas brought me to mixing mediums. One of my fall favorites is bittersweet silver dollars, and Enchantment lilies finished with a few red roses. This arrangement definitely announces the arrival of fall. Or for spring, try silk mid-century lilies, pussy willows, irises, tulips and some fragrant freesias. For best results, the artificial material must be believable, and use the more exotic dry flowers for maximum effect. Using silk flowers also helps us through those dry spots between seasons when the flower choices aren't particularly exciting.

continued

Author makes a regular stop at 18th & Spruce Sts. where she buys her flowers on the way to work.

Plant and flowers have found a permanent home in interior design. I have always found working with them very tranquilizing. No matter how late, or how hurried I am, once I begin to work, I have no sense of time and soon lose myself completely. They have brought me color and sensitivity, plus the immense satisfaction of knowing that what I do is greatly appreciated and enjoyed by everyone who sees my work.

When I fill the baskets on my bicycle with loads of flowers and peddle across town, everywhere people stop and smile; no one can resist the profusion of color and sense of happiness my cargo seems to give. I guess it's quite a sight to see!

●

Jean Carte has worked professionally with plants since 1975. She started her own business, Plant Services, in 1976.

Beginning an arrangement at the Frog Restaurant.

A completed arrangement for an individual table at the Frog Restaurant includes pom poms, mums, daisy mums, laurel and statice.

A windowfront arrangement at the Commissary Restaurant — Japanese lanterns, silver dollars, roses, daisy pom poms, mums, bittersweet and coffee foliage.

SOME LESSONS LEARNED FROM OUR PAST HARD WINTERS

by Lois Woodward Paul

Mary Adelaide Reinhard, program chair for the Shawosa Garden Club in Salem, New Jersey, wrote asking me to do a program addressing the problem of keeping a garden going without losing half of it each winter. A timely subject. In my own garden after the winter of '76 and '77 I lost two *Ilex crenata* 'Helleri' hedges that had done well for more than 10 years. A third one I have been able to nurse back.

I wrote to several professional growers and horticulturists in the area asking them to consider, after the past two winters of extremely harsh conditions for many trees and shrubs in our area, what recommendations they would make to the serious amateur gardener for future planting. They shared their recommendations; the reaction of the Shawosa Club members to my talk, which included the professionals' suggestions led me to feel that others might find them useful. So I have included excerpts from their letters.

First, here are a few of my own recommendations for ensuring that our plants make it through the winter.

An abundance of organic matter in the form of well-rotted manure, compost, or peat moss improves root growth. Since we live in the mushroom center of the world in this area, we have access to good mushroom soil at a decent price. I use it generously. If you know the drainage is poor add rubble in the bottom of the hole. On property newly developed with only subsoil bring in all new topsoil for good results.

Some plants are not demanding but others require a definite alkaline or acid soil. Under which conditions did the plant originally grow? How much wind can it take; how much sun or how much shade does it require to use it effectively in the garden?

A good substitute for protective snow covering is some form of mulch, i.e., any loose organic material. Keep it well away from the base of the trees or shrubs to protect them from rodents that might damage the bark. Mulching also reduces the depth to which frost can penetrate and lessens alternate freezing and thawing, which is so destructive to the root system.

I am careful not to prune or feed needled or broadleaved evergreens after the middle of July. Pruning and feeding later than that stimulates growth, which would not have time to harden before freezing weather.

The need for watering the garden two or three times before freezing weather was well explained by James E. Cross in *Green Scene* (Sept. '78) "The Winter of 76-77—To the Root of the Problem."

For a few special broadleaved evergreen plants that may need extra care, use an antidesiccant such as Wilt-Pruf.

. . . the past two winters have been most helpful in pointing out which groups of plants we cannot rely on for the backbone of our gardens.

My experience has been that spring planting and feeding enables roots to become established during the entire growing season in contrast to fall planting followed by the rigors of winter.

In future planning we should remember that "hardy" means the plant is able to live through the winter at a given place, and that the roots are not as hardy as the tops; that is, they are more susceptible to damage. Many container-grown plants winter-kill for this reason.

* * *

Now for the comments from experts:

David B. Paterson, horticulturist at Longwood Gardens, feels we should not be discouraged by the last two winters. He stresses buying hardy varieties when shopping for new plants for gardens. Longwood Gardens lost no *Ilex crenata,* Japanese holly, but the variety 'Stokes' was the poorest. Many camel-

lias and rhododendrons were either killed or left with partial dieback but these had done well previously because of unusually mild winters. Paterson recommends buying from a reliable nursery, not one that brings in plants from warmer climates for quick sale. His final advice, also that of J. Franklin Styer, was to plant the basic part of the garden with proven, hardy plant material, then experiment in the microclimates where the overall design is not affected.

* * *

Nurseryman **J. Franklin Styer:**

"I am not pessimistic about winter injury losses. From a small garden to a forest, maturing plants and trees must be removed or die, to make room for normal growth. Winter losses seldom exceed this annual average.

"I once planned a book on hardiness. As notes accumulated they dissolved into a long series of individual problems, and low temperatures became almost a minor element. In the winter of '77 temperatures went only to -6°F (-21°C) for about three mornings; 1978 went -1°F (-19°C). Whereas 1934 registered -20°F (-31°C) and 1937-38 the same.

"Here's a list of the killing factors: sheer cold, wind, sun, sudden emergence from sun to shade, ice accumulation around stems, soft growth due to late fall over-fertilizing, lack of potash in the fall, air pockets, air pollution, reflected sunlight, mice, injury from hoeing, and hot winters causing failure to break dormancy."

* * *

Richard Lighty, educator and coordinator of the Longwood Program at the University of Delaware, sent two comments on the future course of gardening in light of the past two winters. One is fairly specific, and one is rather philosophical. He writes:

"First, the past two winters have been most helpful in pointing out which groups of plants we cannot rely on for the backbone of our gardens. The cultivars of *Ilex crenata* and *Camellia japonica* fall into this category. Still, I would encourage gardeners to use the plants in specific sites where they are the best answer to the design need. My planting of *I. crenata* 'Helleri' looks the best it has ever looked, and they are more than 15 years old. My *Leycesteria formosa,* planted in the open, killed to the ground, but is now up to five feet and threatening to bloom only a little late. The point is that there are so many variables of site within even the smallest garden, that one never can predict. By the same token, the backbone of the garden should be established using reliable plants that fit the need.

I firmly believe that it is the process of gardening that should matter to the gardener. Others can delight in the product.

"Second, I firmly believe that it is the process of gardening that should matter to the gardener. Others can delight in the product, and the gardener can delight with them, but a garden only bought and paid for eliminates the personal joy of creation. As in all arts, a large measure of experimentation must enter into the creative equation. That involves experimenting with all of the garden elements including new plants. How many "borderline" plants were actually lost or grossly disfigured the past two winters? I submit that the picture has been clouded by the too-wide use of "experimental" plants, not by their careful use."

* * *

William H. Frederick, Jr., registered landscape architect and garden consultant from Hockessin in Delaware, writes:

"I think I felt the effect of the last two winters a little more than most gardeners because during the fall just before the winters of '77 and '78 I had made an extensive planting in my garden near Hockessin, Delaware, of a fairly wide variety of plant material.

"Much of the planting is in an exposed situation. After the first winter everything looked like the devil and I was devastated. To my surprise none of the plants died completely and everything made some new growth. I mulched heavily before the second winter and watched with great interest. The injury on the broadleaved evergreens was bad again in the spring of '78 but with the help of the following marvelous growing season, recovery has been impressive. I don't feel that I am out of the woods, but I feel encouraged.

"From my experience in general with established plants as well as new installations I would draw the following conclusions for the "serious amateur":

"Deciduous Trees and Shrubs. Aside from *Clerodendrum trichotomum* I really can't think of anything I have always grown that I wouldn't continue to grow. One year out of 26 with dead flower buds on dogwoods and wisterias is acceptable to me.

"Herbaceous Plants. These two winters made herbaceous plants look better than ever to me. When many of the woody plants were struggling through, the herbaceous plants were sending up their *usual* fresh cheerful new growth and usual abundance of fat flower buds.

"There is, of course, a wealth of additional plant material for the advanced gardener who will think seriously about individual plants and microclimates. *Fuchsia magellanica* came through last winter here at the base of a south-facing wall and one agapanthus came through its fifth winter here at the base of an east-facing wall. There is the additional factor of age. Many plants normally rated not hardy here come through perfectly well if their wood is heavy enough when the tough winters come. This has got to be part of the explanation for the good performance of the *Araucaria araucana* at Rockwood, an historic property just north of Wilmington. (I understand that they were grown in a greenhouse for many years

continued

photo by William H. Frederick, Jr.

recommended

Mahonia bealei

photo by William H. Frederick, Jr.

Gable 'Stewartsonian'

not recommended

Camellia x cv. Aida, March '77 at Longwood Gardens

Longwood photos by R. J. Armstrong

WILLIAM H. FREDERICK, JR. RECOMMENDS	DOES NOT RECOMMEND
Needled Evergreens I would continue to recommend virtually all of the needled evergreens I have always used. I do think *Cedrus deodara* 'Kashmir' is more consistently free from needle burn than the type. I'm sure that *Cedrus libani* 'Stenocoma' will come through without a scratch when the type is chancy.	
Broadleaved Evergreens Azaleas (most) (particularly enthusiastic about Gable hybrids, especially 'Stewartsonian') **Buxus sempervirens* 'Welleri' *Elaeagnus pungens* 'Fruitlandi' (in windfree places, especially if early spring appearance is not of paramount importance) **Ilex crenata* 'Microphylla' *Ilex opaca* Bosley's *Ilex opaca* 'Hedge Holly' Orton's *Ilex opaca* 'Jersey Princess' **Ilex* x *Meserveae,* Conard Pyle hybrid *Ilex pendunculosa* *Ilex pernyi* **Ilex* x 'John Morris' (I am trying this hybrid as a pollinator for 'San Jose' because I received good reports.) **Ilex* x 'San Jose' *Liriope muscari* clones 'Big Blue' 'Munroe White' 'Variegata' (They will burn in late winter unless on north side of the house, north slope, or in evergreen shade. Burnt foliage can be cut off and new growth will quickly cover.) *Mahonia bealei* (north side of a building or in light shade; otherwise its early spring appearance is not as lush as it should be) *Prunus laurocerasus* 'Schipkaensis' *P. laurocerasus* 'Zabeliana' (both good in windfree locations; 'Zabeliana' surprisingly hardier than 'Schipkaensis') **Pyracantha* 'Mohave' (tops for orange fruit) *P. rogersiana* *Rhododendron maximum*	*Aucuba japonica* any camellias any daphnes evergreen barberry any evergreen ligustrum *Ilex aquifolium* *Ilex crenata* (all clones except 'Microphylla') *Ilex cornuta* 'Burfordi' *I. cornuta* 'Nellie R. Stevens' *I. cornuta* 'Rotunda' *Magnolia grandiflora* ('Edith Bogue' came through for me as a 6-8 ft. plant in an exposed location. It did not come through at Longwood.) *Osmanthus armatus* *O. heterophyllus* *O. heterophyllus* 'Rotundifolius' *Pyracantha* (no yellow-berried forms)

*Received good reports

before they were planted out.)

"In summary, I would no longer recommend to serious amateur gardeners quite a few of the broadleaved evergreens that we have enjoyed in this area in the halcyon days between the hard winters (see box). The hard winters have forced us to limit our palette in this region, and they have made us realize the great worth of herbaceous plants. This realization can only have a positive effect on the quality of future gardens and future garden design."

* * *

You will note from all of these comments there is some consistency, and some divergence of views. I appreciate their willingness to share their individual views with us. I hope that with this advice we will not lose half of our gardens to the winter.

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Lois Paul recently retired as head of the Department of Education at Longwood Gardens. She is a member of the PHS Council.

A TREE FOR ALL SEASONS

by Bebe Miles

Did you choose your last tree because it bears lovely flowers? Or because it displays gorgeous fall fruit and foliage? Or perhaps because its winter silhouette is as interesting as its shape fully leaved?

Any one of those is a good reason for selecting a particular tree for a property. Supposing, however, there was a tree that had all these excellent attributes? Ah, but there is. This paragon is none other than our own native eastern dogwood *(Cornus florida),* and the Delaware Valley is fortunate that hereabouts conditions are well-nigh perfect for this wonderful tree. (We will ignore completely the fact that the past two uncommon winters have wreaked havoc with our dogwood blossoms, such small misadventures will only help us appreciate this next spring's glory.)

We once bought a house mainly because a dogwood stood beside it, and if I were ever limited to having but one tree, this one would win hands down. It has many fine characteristics. For one, *Cornus florida* blooms at an early age, often when only a few feet high. For another, it is an astonishingly quick grower; I have seedlings taller than I after only a few years of growth.

To add that it is also a fine shade tree seems almost too much, but because of its horizontal branching habit, a mature dogwood casts more usable shadow than many of its taller companions. This makes it ideal to convert a sunny patio into an oasis of shade. The dying flowers make no mess, and the fruit is eaten so rapidly by the birds that it too is never a problem. Nor do the clean, lustrous leaves attract any nasty worms or bugs or drop on those who sit beneath.

Because the flowers open before the leaves are full-grown, their beauty is displayed to its fullest. Small wonder that such spots as Valley Forge Park (where dogwoods have been planted in quantity as memorials) attract great crowds of sightseers each spring.

As a last good point in its favor, a dogwood never outgrows its site. Maximum height is listed as 40 feet, but most dogwoods in our area top out at about half that figure. Not too tall in proportion to a small house, but quite stately enough for the most pretentious mansion. If there is any precaution necessary, it would be to suggest that you not plant specimen dogwoods closer than 15 feet simply because crowding subtracts from the effect of the mature tree. A grove of them, nevertheless, is a magic spot, and in the wild one often sees dogwoods scattered this way. Under such circumstances they are more prone to stay smaller and shorter because of competition.

Surely there must be something wrong with this tree? Well, yes, reluctantly I mention that dogwoods do sometimes get borers in either branch or trunk. The former is not serious if caught in time, simply remove the offending branch, and the tree will soon grow back into a pleasing shape. If the infestation is not widespread, you can often spear the borer with a long wire and apply a paste from the hardware store. Such procedure is the only possibility if the borers get into the main trunk. A well fed dogwood that gets adequate moisture is less apt to fall prey to the borers. Make sure too that you keep grass away from the trunk with an encircling saucer, for trees barked by lawn mowers are always more prone to disease.

choosing

Having decided that *Cornus florida* is for you, there remains only one further task: which one do you want? The type that bears large white blooms? Actually the showy portions of the blooms are bracts rather than petals, but this is a botanical point. The tiny true flowers are in the center of the

continued

Top left, double-flowering dogwood *(C. florida pluribracteata)* is a rarity.

Top right, dogwood *(Cornus florida)* berry crop contrasts with fall seed heads of clethra bush in foreground.

Bottom left, warm fall foliage color of eastern dogwood *(Cornus florida)*

Bottom right, covered with ice, a dogwood *(Cornus florida)* displays interesting winter silhouette.

A TREE FOR ALL SEASONS continued

ornamental bracts, and it is these that turn into tight clusters of bright red berries by late summer. While most beautiful, the berries get gobbled up by the birds as soon as ripe. To make up for this the leaves themselves turn warm shades of scarlet to maroon. Seen against evergreens or a white house, a dogwood in fall is a real knockout.

For myself, I prefer the white flowering dogwoods, but a red or pink variety can be most striking if positioned with imagination. Plan the setting so it can be viewed from your favorite window. One red dogwood among a group of whites gives more effect than a number of colored ones.

There is a wide range of possible hues among these non-white dogwoods. Named clones should all come true, but many nurseries sell them simply as "red." The best advice is to choose such a specimen when it is in flower. Dogwoods transplant better in spring and do very nicely even moved in bloom. So there is no reason why you can't get a flesh-colored one or a pink or a rather vivid red, depending on your own personal desires.

Less well-known is the cultivar 'Welchi' and another traded as 'Rainbow.' Both of these have variegated foliage which sometimes displays leaves with shades of green and cream and red, all at one time. Their main use is as a focal point, or as a special specimen. There is a weeping form, 'Pendula,' which leaves me quite cold, but there must be those who love it. Even rarer is the variety 'Xanthocarpa,' which bears yellow fruits.

If you lean to the esoteric, the double-flowered *C. florida pluribracteata* will intrigue you. When I bought mine, I was told it was a slow grower, but it has suddenly taken off and looks as if it will soon catch up with its more common companions. Because its flowers are sterile, there are no fall berries. The blooms last longer than the singles, however, especially when we have a heat wave during dogwood blossom time. As an aside, I will mention also that my double-flowered dogwood bloomed beautifully last spring when most of the singles gave such a poor account of themselves. I cannot explain that at all.

Back at the beginning I stressed the interesting winter silhouette of the dogwood tree. Partly this is due to the horizontal branching habit and the almost finger-like growth of the small twigs at the ends of the branches, but there is another bit of decoration. The buds form in late summer at the tips of the twigs. By wintertime they are quite large and noticeable. Even encased in ice, the buds are pregnant with a promise of spring. Sometimes in a light snow they catch the flakes just right and look almost like pom pom flowers.

We once bought a house mainly because a dogwood stood beside it, and if I were ever limited to having but one tree, *Cornus florida* would win hands down.

Should midsummer be very dry, you are advised to water your dogwoods deeply several times. This helps bud formation. We never have as good a crop after summer drought.

Other cultural details are simple. The dogwood prefers humusy soil on the acid side. Around here it will do well in almost any exposure, but it is not recommended for extremely dry sites. In the wild the dogwood is an understory tree, doing well in the shade of taller companions. One of the glories of spring in the country is to see the dogwoods in full bloom lighting up a deciduous woodland. Flowering is better, however, if a tree gets at least good light. With rich soil and adequate moisture the dogwood is happy in full sun in our climate. A wood chip mulch helps conserve soil moisture. Pruning is wiser in midsummer because the dogwood bleeds if cut or wounded in spring. I have seen a tree, broken in a late icestorm, literally drip sap.

With its tiers of blossoms a mature dogwood really needs nothing more, but this tree looks particularly lovely as part of a garden too. Spring flowers set it off to perfection. Stay with shallow-rooted species, however, because the dogwood has many roots near the surface. A spot beneath it can become quite dry, especially in the heat of summer. Such a site quite suits many spring-flowering bulbs, so they are a good choice with some groundcovers to take over for the warmer months.

In such a situation it is a good idea to trim off the lowest branches of the dogwood to let some light into the area underneath. Otherwise a single specimen will often have its lowest branches sweeping almost to the ground. While breathtaking in bloom, this is difficult for lawn mowing, and few flowering plants can adapt to such dense shade.

Wherever you put your dogwood and however you use it, you'll never be sorry you added it to your property. I think I love mine best in that dreary period of late winter when the swelling buds give eloquent testimony that spring is coming. Except that full bloom is so lovely also. And it's amusing to watch a flock of birds fighting over the berries as summer wanes. Then too the foliage is so warm as the days shorten and the cold winds return. Truly, a tree for all seasons.

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The latest book by Bebe Miles, *Wildflower Perennials for Your Garden,* was recently the selection of the American Garden Guild Book Club and is being issued in paperback by Hawthorn next month.

Gray: A Virtue in the Garden

by Barbara Bruno

Plants with soft gray or sparkling silver leaves have always been my special favorites. Whole gardens have been created using only gray plants, but even one or two can give new life and sparkle to perennial borders or foundation plantings. They are great blenders, both toning down strident colors and emphasizing and brightening pastel flower shades. Garden grays exist for almost any garden need; the range of leaf sizes, shapes and textures to choose from (if you are willing to search) seems endless. Most are tough, sun-loving plants whose only enemy is excessive moisture, but a few even prosper in semishade.

Plant grays vary greatly from garden to garden not only because of natural variations, but because the quality of the soil on which it is grown varies. Often plants on rich soil given extra moisture grow lush and lose much of their gray coloration. The time of year is another factor. Some plants are much grayer in summer drought; others lose grayness as their leaves age. The contrast between a plant and its surroundings is most important. A plant that might not be considered a true gray in one garden might appear startlingly cool surrounded by shiny, dark green foliage in another setting.

Silvers are especially important in my garden, which is planted heavily with herbs and depends on contrasting leaf form and color for much of its beauty. In this setting the great range of subtle gray textures and tonalities is clearly seen. The gray-greens, pewters and silver-whites in fine and fringed leaf add a flowery look when little is in bloom. The broad leaves of other grays furnish bold accents, and many of these plants keep their good looks into winter, an added bonus.

Most plentiful in my collection are low to medium height, mat forming plants. Many of these are admirably suited to border edges; others can be tucked in wherever a silver gleam would be appreciated. To begin with the smallest several of the creeping thymes are super grays. Wooly thyme *(Thymus pseudolanuginosis)* is perhaps the choicest. It spreads a slow-growing, fuzzy gray carpet over the bricks at the edge of a sunny terrace. Here it receives the constant air circulation and good drainage on which it thrives. Wooly stemmed thyme *(T. thracicus)*, a vigorous variety with free-blooming ways in full sun, will obligingly grow in filtered sunlight. I use it along a pebbled driveway where a bit of fuzzy gray that survives occasional footfalls is most welcome. Silver variegated thyme *(T.* x *citriodorus* 'Argenteus') is, not strictly speaking, gray, but the tiny, green leaves edged in white give a sparkling gray-green effect like no other plant. It is short-lived, and as young plants give the freshest effect anyway I tuck them in wherever a bit of brightness would be appreciated.

A pleasant silver little seen in gardens is *Lychnis coronaria,* the rose campion.

The mat forming dianthus offers solid sheets of grassy, gray foliage that remain attractive throughout winter. Laced pinks, an antique form with maroon and white patterned flowers, share the border edges with a single, free flowering, red-eyed pink that grew in my grandmother's garden. Tight, mossy mats of cheddar pinks contrast pleasingly with the billowing thymes planted along a fragrant walk. In spring its short-stemmed flowers of bright pink fill the air with one of the most deliciously spicy odors that I know of.

Lamb's ears *(Stachys byzantina)* is one of my favorite garden grays. Its thick, wooly leaves, soft to the touch, do resemble their nickname. The coarse, textured mats of silverwhite contrast most attractively with other edging plants of finer leaf and keep their eye-catching brightness from early spring through late fall. I read of flopping flower spikes, but the strong and straight spikes of plants grown on my sandy soil remind me of silver candles, often remaining effective for two full months. The lack of showy flowers on these beautiful spires is not important. Grouped with lavender at the foot of a clump of vivid orange daylilies it makes an especially handsome picture in July. *Veronica incana* reminds me of a lean, elegant version of lamb's ears until it holds plentiful, violet-blue wands proudly aloft in June. It is a slow, but steady grower, thriving in my poorest soil. Use it at the base of upright, self-supporting plants since good air circulation is a must.

a puzzling array

A puzzling array of plants are sold by nurseries as *Nepeta mussini.* I have three kinds not yet properly identified. One has enough silver in the pale jade of its small, pebbly textured leaves to be considered a gray plant. The leaves

continued

photos by author

Artemesia 'Silver King' and mock orange in June garden.

become progressively smaller and grayer toward the ends of the much divided stems. Each stem ends in a froth of tiny, blue-powdered-lavender flowers in June, repeating its performance again in late summer if stems are cut back after flowering. The plants flop under the weight of their blooms, flowing gracefully over border edges. They fit in beautifully anywhere, but their spreading pools of soft purple are especially fine with the cascading bloom of dusty pink old roses.

A number of artemisias qualify as edging material. *Artemesia pontica,* Roman wormwood, offers the finest lace among the grays. If properly handled it is a delicate, feathery cloud of silver, keeping to its alloted space; uncontrolled, it is more invasive than any mint. To make the difference give it an early spring check by undercutting it with a hardy shovel thrust. *A. frigida,* an American native, takes the place here of *A. schmidtiana,* an equally lovely plant where it grows well. It offers a similarly shimmering fringe of soft, silver leaves. During spring, gracefully swaying, silver wands are produced. After these are cut away in mid-July the plant makes a lovely mound of silky threads. It grows almost as well in part shade as in full sun. Another low growing artemisia with an unusual, heavy textured look is *A. stellarana,* beach wormwood. It forms a spreading clump of frosted, multi-lobed leaf rosettes which keep their good looks through most of the winter. It seems to benefit from frequent moves; young clumps are the most luxuriant, but move it only in the spring.

Several fine yarrows possess silver foliage. *Achillea tomentosa,* which seems to prefer a heavier soil than that which I have to offer is a delightful, low, corally mass of thick, heavily felted leaves. I like *A. taygetea* and its hybrid *A.* 'Moonshine' behind the lower growing lavender and pinks, but they are also superb tall edging plants. Both have handsome, dull gray, ferny leaves. Blooms are the familiar, flat yarrow "plates," but in a lovely, pale yellow. 'Moonshine' flowers are a shade brighter with foliage more finely divided. Either plant is lovely grown with white *Salvia sclarea,* lavender and burgundy leaved sage. A tall grower for mid-border is *Achillea* 'Coronation Gold,' a paler version of *A. filipendulina,* with masses of ferny gray leaves and bright, clear, lemon yellow bloom. If cut back after a copious June bloom all of these yarrows produce occasional summer flowers.

A pleasant silver little seen in gardens is *Lychnis coronaria,* the rose campion. It is a native of Southern Europe and a prolific seeder that still holds its own among the weeds of long forgotten gardens all over this area. The rosettes of wavy edged, felted leaves are quite pleasing, but the campion-like flowers in shocking magenta does make careful placement a necessity. I have read with interest of a pink and a white variety which I'd like to acquire. Meanwhile, I'll watch for a color break in a chance seedling.

If you're looking for a large plant that is most handsome and unusual try *Festuca ovina glauca.* The lyme grass requires quite a bit of space for its fountain of ovina blue-gray leaves. I've always thought it would be spectacular grown with *Onopordum nervosum,* the tall, silver thistle.

semi-shade

For semi-shaded spots I treasure my white flowered bleeding heart, *Dicentra formosa* 'Alba.' It is a lacy ghost of a plant (much grayer of leaf than the more common pink) that carpets the space between the posts of a weathered rail fence. Flanked by the contrasting silver of lamb's ears and a low carpet of wooly thyme, it is sheltered overhead by a shiny-leaved, old climbing rose. In June, nodding white roses opening from palest apricot buds add the heady magnolia-like fragrance to a scene whose delicate coloring is most pleasing at any season.

Although slow to become established Russian sage *(Perovskia atriplicifolia)* is worth the wait. It would be at home

Lamb's ears, silver candles, tall and straight

The awesome prickly candelabra of *Onopordum nervosum*

Gray for the Garden

Achillea 'Coronation Gold'
A. filipendulina
A. 'Moonshine'
A. taygetea
A. tomentosa
A. absinthium 'Lambrook Silver'
Artemesia absinthium, wormwood
A. arborescens
A. frigida
A. ludoviciana
A. pontica, Roman wormwood
A. schmidtiana
A. 'Silver King'
A. stellarana, beach wormwood
A. versicolor
Buddleia crispa
Dianthus gratianopolitanus, cheddar pinks
Dicentra formosa 'Alba'
Festuca ovina glauca
Helichrysum angustifolium
Leucophyllum frutescens, Texas silverleaf
Lychnis coronaria, rose campion
Nepeta mussini
Onopordum nervosum, silver thistle
Origanum dictamnus, Dittany of Crete
Perovskia atriplicifolia, Russian sage
Ruta 'Blue Beauty,' rue
Salvia argentea, silver sage
S. sclarea
Santolina chamaecyparissus
S. neapolitana
Senecio cineraria, dusty miller
Stachys byzantina, lamb's ears
Teucrium fruticans
Thymus x *citriodorus* 'Argenteus,' silver variegated thyme
T. pseudolanuginosus, wooly thyme
T. thracicus, wooly stemmed thyme
Verbascum bombyciferum, silver mullien
Veronica incana

continued

A late day garden view in June (my favorite)

in any color scheme with its tall, white-stemmed wands clothed in small, toothed, jade-gray leaves and its long blooming spires of tiny, lavender flowers. I use it as a splendid foil to richly colored, late blooming daylilies or, combined with tall, flaxen, striped grass to soften the harsh gold of summer daisies. It prospers on poor, light soil; too rich a diet makes for flopping growth. The long-lasting gray stems are most attractive in the winter garden.

The palest silver wands of the tall growing artemisias are well known.

One of the most spectacular of silver plants is *Onopordum nervosum.*

Artemisia 'Silver King' is the most sparely elegant of the lot. It makes a ghostly cloud at the back of a border, growing more beautiful as summer progresses into fall. Billows of tall, mauve asters rising above its frosted stems is an autumn highlight. *A. ludoviciana* is set closely with deeply cut leaves. It forms a more solid looking mass of silver, inclined to lean a bit. A third kind, collected from an abandoned garden, has undivided leaves and makes a close thicket of stems in a shorter clump. All of them are so useful in cooling and mixing exuberant summer colors that I can't imagine the garden without them.

The list of silver shrubs that I grow is not long, but each is uniquely different. What could be better for delineating the corner of a bed than a tight mound of neat silver? Even after the devastation of the winters of '77 and '78 lavender still plays an important part in my garden plans. I treasure it for the lavender spikes of summer bloom and its old-fashioned fragrance. Its evergray winter dress makes it doubly valuable in this mostly perennial garden.

Wormwood *(Artemisia absinthium)* makes a ragged, aromatic, pewtery gray bush. Its cultivar 'Lambrook Silver' is a choice form. While smaller and less hardy than the type, its much divided leaves are a shimmering silver. Lamb's ears and golden thyme grow with it at a border edge, a pleasing, pale trio. An unusual artemisia is *A. versicolor.* It resembles a silver twin of the camphor scented wormwood. One of my plants has produced a gray-green branch, which leads me to suspect that it is a silver sport of the latter. It makes a low spreading mound of distinctive, lacy, filigreed leaves, which are especially handsome at the base of old roses.

No other shrub is like lavender cotton *(Santolina chamaecyparissus).* One of the whitest of silvers, it makes a handsome, coral-like mass, a most effective contrast to more filmy material. *S. neapolitana* is a more feathery member of the family growing well in full sun or light shade.

A gray shrub worthy of a place in the flower border is common sage. Its pebbly leaves and pale lavender spikes of June flowers make it a perfect companion for old roses. Combine the free-blooming dwarf form with *Achillea taygetea* and rue *(Ruta* 'Blue Beauty'*)* for a lovely, long-lasting garden picture.

spectacular silvers

Some of the most spectacular silvers are biennials. Two worth trying are *Verbascum bombyciferum,* the silver mullien, and *Salvia argentea,* silver sage. Both make large rosettes of heavily felted, silver leaves, but they are very different in effect. The verbascum has broad, supple leaves covered with short, velvety felting. Silver sage leaves are deeply textured and crisply hairy. When I grew the salvia many years ago I was disappointed in its dingy white flowers but would like to try it again if only I could locate a source of seed. The verbascum has a typical mullein candle of yellow bloom, but the spike itself is a sensational, cotton-coated exclamation point. Give both of them a spot toward the front border edge where the lovely leaves can be admired and air circulation is particularly good.

One of the most spectacular of silver plants is *Onopordum nervosum.* This silver thistle in its first summer makes a handsome 3 ft. rosette of huge, felted leaves with fetchingly waved and fearsomely prickled edges. Veins are marked in chalky white while benath the fuzz shows a bluish sheen. In early June of the second year the plant begins a Jack-in-the-beanstalk climb, forming an awesome 7 ft. prickly candlelabra dotted by numerous purple thistle bloom. I love the flower's powdery, hot honey fragrance, typical of all thistles. So do scores of bumblebees and butterflies. The plant is an insect photographer's dream.

I grow a few tender silver plants that are effective in the summer garden. Dittany of Crete *(Origanum dictamnus)* makes a low, round-leaved, gray doily that adds the variety of its pink, knotted bloom to my fragrant thyme border. *Artemisia arborescens* is the English writer G. S. Thomas's favorite artemisia. With its splendid, lacy leaves of silky silver-white it is easy to see why. *Buddleia crispa* blooms the winter away in a sunny window. It does the same in the summer garden, the fragrant blooms emerging from felted buds. The cottony stems and soft, furry leaves make a lax, 3 ft. bush in the occasional year in which it survives a winter outside. Curry plant *(Helichrysum angustifolium)* is an almost hardy shrub whose tightly packed, needle-like leaves are bright silver. According to one's tastes, its pungent smell can be a minus or plus.

I am trying two other supposedly tender shrubs, which I hope will prove otherwise. *Teucrium fruticans* is a native of Southern Europe, and is hardy in England. It is a gracefully sprawling bush with thin, white stems clothed with small, widely spaced pewter green leaves. The second, *Leucophyllum frutescens,* the Texas silverleaf, is a pretty, small-leaved shrub with orchid blooms. I've planted both in a warm, dry border along the south house foundation.

Much more could be said of these interesting and useful plants. There are silver foliaged annuals with bright, daisy flowers, the various whites of the plants known as "dusty miller," diminutive alpines and many more hardy and tender perennials that you might wish to try. Be sure to make room for an unfamiliar garden gray in your garden this year.

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Barbara Bruno is a self-taught gardener, whose training has come from experience and frequent trips to the PHS library. An artist, she finds the garden a constant source of inspiration in her work. Her special interest is the aesthetic impact of plants in groups, how best to place and combine plants to enhance their beauty. She says she struggles to balance the acquisitiveness of an avid plant collector with the aesthetic sensitivities of the landscape designer.

Plant Propagation in Winter

by Lynne Lamstein

In the midst of winter, when the seeds have been ordered, before the crocus blooms, there's gardening work to do. The early months of the year are the best time for the propagation of many woody landscape plants.

Stem cuttings used for propagation in winter are considered hardwood cuttings, which means they should be taken when the plants are dormant. They consist of wood of the previous season's growth and can be deciduous or evergreen. Deciduous hardwood cuttings are leafless.

Most conifers root well from hardwood cuttings, which should be taken from well-formed healthy plants and be from 3 to 8 in. long. In addition to the previous season's wood, cuttings can include growth from the two or three earlier years. Remove from the plant with a clean cut just below a node, as usual.

Removing the leaves and twigs from the bottom one-third of the cutting by gentle tearing produces small wounds that allow the stem to better absorb root-inducing substances. A root-inducing substance such as indolbutyric acid (IBA) at a strength of .3% or .5% works well for many conifers. It speeds the rooting process and in some cases makes the difference between rooting and not rooting. (IBA is commercially available as Hormodin or Hormo-Root.) The cuttings are inserted in a clean and well-drained rooting medium such as equal parts of peat moss and perlite or peat moss and sand. They should be provided with bottom heat of 75°F if possible and placed in a humid environment. A mist system with bottom heat works well; but since such a setup is not likely to be on hand, try putting the cuttings in a polyethylene tent and placing the tent on top of fluorescent lights (see illus. p. 18). A fluorescent fixture gives off gentle warmth above the tubes.

rooting from stem cuttings

Hardwood conifer cuttings take from a few weeks to a year to root. Many chamaecyparis cultivars root dependably in three months from cuttings taken September to April. Early winter cuttings of *Juniperus horizontalis* and other low-growing junipers root well in about two months. Hemlock cuttings taken fall or winter root in good percentages, but are likely to take four or five months to do so. Firs and pines are particularly difficult to root and are more commonly propagated by seeds or grafting.

Several species of holly, while satisfactory rooters from late summer cuttings, also root well if taken in January or February. Here at the Morris Arboretum the softly tufted *Ilex pedunculosa,* the long-stalk holly, has been rooted successfully from both August and January cuttings. The cuttings taken in January were 5 to 6 in. long. The leaves were removed from the bottom third of the cuttings, which were then wounded with a knife and treated with IBA. Cuttings stuck in equal parts of peat and perlite and placed under mist with bottom heat

continued

photos by Lynne Lamstein

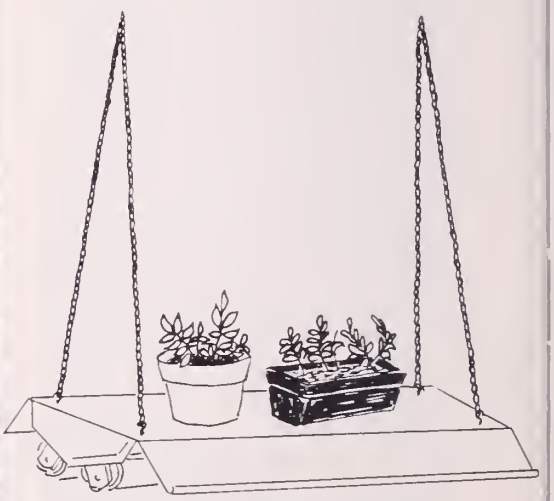
Ilex pedunculosa, 10 months from cuttings

Franklinia alatamaha

had good root masses in ten weeks.

Many home gardeners have successfully propagated deciduous shrubs from hardwood cuttings taken in fall and buried in the ground until spring. For winter propagation, there are other deciduous plants that can be produced from cuttings taken in the early months of the year and stuck directly in the rooting medium. Such cuttings have already experienced the necessary cold period by virtue of being outside throughout the fall and early winter and are prepared to begin growth. Hardwood grape cuttings from healthy, mature plants root easily without root-inducing chemicals. Cuttings one-half inch in diameter and 12 to 15 in. long can be made from the prunings of early March. *Franklinia alatamaha* roots as well from hardwood cuttings in January as it does from softwood cuttings in spring. The hardwood cuttings can include more than one season's growth and therefore can be longer than the softwood cuttings, producing larger plants more quickly.

Willows also reproduce cooperatively from hardwood cuttings in winter. The



rounded and compact black willow, *Salix gracilistyla melanostachys,* propagated at the Morris in February from 5 in. cuttings, showed roots within two weeks. The one difficulty we had propagating the willow was collecting the cuttings—the only way to reach the plant was by snowshoe. Arboretum propagation of the fantail willow, *Salix sachalinensis* cv. Sekka, yielded well-rooted plants in three weeks from cuttings taken in late winter and placed in vermiculite under mist. Root-inducing substances are not necessary for willows and are more likely to burn the stems than to hasten rooting.

inducing stems or roots another way

While propagation by stem cuttings involves the formation of roots on existing stems, it is also possible to induce the formation of stems and additional roots on existing roots. Root cuttings are best taken from October to March, when the roots are well supplied with stored nutrients. Where frozen ground is a likelihood it's best to take the root cuttings in the fall and store them in flats in a cold frame or use them immediately. If a milder winter is predicted, it may be more convenient to dig the roots in January or February when gardening chores are minimal.

The roots are dug with a spade and cut into 1 to 5 in. pieces, depending on the thickness of the roots. Fine roots are used in small pieces and are generally placed horizontally in a flat of sand or soil, and covered with no more than an inch of medium. Thicker roots are cut into 4 to 5 in. pieces and placed vertically with an inch protruding over the top of the medium. With these roots it is essential to mark the proximal (nearer the tree trunk) and distal (away from the trunk) ends (see illus. p. 19), perhaps with a slanting cut on the distal end. The process will only work if the polarity is properly maintained; that is, distal end down, proximal end up.

The one difficulty we had propagating the willow was collecting the cuttings—the only way to reach the plant was by snowshoe.

Root cuttings are kept under high humidity. In some cases new roots form first, in others shoots appear before new roots form. At the Arboretum the native *Rhododendron canescens* sprouted in 14 weeks from 4 in. root cuttings taken mid-December and placed vertically in 3 in. pots with one inch above the pot. Root cuttings of the red berried deciduous tree, *Idesia polycarpa,* produced new plants in three months. Although many root cuttings yielded only a few plants, the process is valuable because idesia is very difficult to propagate from stem cuttings of the mature plant.

Some other plants that can be propagated from root cuttings are *Cydonia sinensis,* Chinese quince; *Cedrela sinensis,* Chinese toon tree, syringa (species and hybrids), lilac; *Campsis radicans,* trumpet vine; *Sassafras albidum,* common sassafras.

Add propagation to your list of winter activities. It may grow on you.

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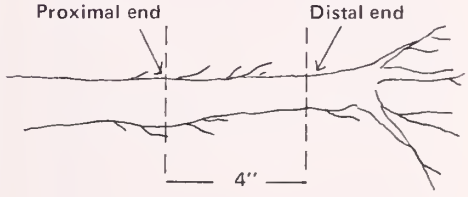
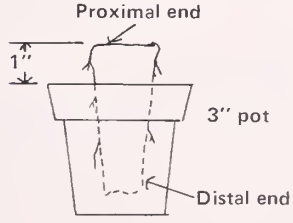
Lynne Lamstein is plant propagator at the Morris Arboretum.

Salix sachalinensis 'Sekka' (fantail willow), 10 months from cuttings

Root cuttings of medium size root pieces





Catalogs- OH WHERE OH WHERE

One day last spring a neighbor asked me where she could buy a 'Captivator' grape, an oldtime table variety, and, according to my friend, the finest ever grown in the northeast. I thought I knew a source but longed for the easy access I once had to the hundreds of up-to-date nursery and seed catalogs in the PHS library.

Now 300 miles and two years away from Philadelphia, I must rely on my own collection of catalogs as sources for a wide variety of plants. I located 'Captivator' in the Southmeadow Fruit Garden catalog. Southmeadow lists old and hard to find varieties of tree, bush and vine fruit varieties.

Shortly after my grape search, I decided to look over the catalogs I had collected during the past two years and put them in some sort of order. Now many months later the collection is still in disarray, some in an old library storage box and others in a file cabinet. Looking through the catalogs, naturally led to reading them, quite like looking up one word in the dictionary and reading the definitions on the entire page. The only semblance of order that now exists is that the catalogs are grouped together by subject.

As a garden consultant, I am constantly plant hunting for clients as well as for myself. Recently I've looked for sources selling the new Malesian Vireya rhododendron (suitable for greenhouse culture), an old rose variety to complete a garden plan and some low branching sturdy snapdragons of medium height.

Several guides in the PHS library have helped me on my plant hunting expeditions. The advertisements in the many garden magazines in the library are useful in locating material. *The Green Thumb Book,* a source guide by Marion Schroeder, is available on the reference shelf. Plant society publications often list sources for hard to find plants. The other good reference is the index to the *Avant Gardener. Avant Gardener* was where I found the name of the nursery selling the Vireya rhododendrons—Greer Gardens in Eugene, Oregon. If you know which nursery you are looking for the library's catalog collection is always available for browsing.

The catalogs I have collected suit my needs. I do look forward to the general seed and bulb catalogs I receive every year, the best bargains in gardening, as most of them are still sent free of charge. But there are others that have filled specific needs and these are the catalogs I want to discuss.

PHS member and landscape architect, Susan Plimpton, introduced me to Stokes Seeds. I had been looking for a kind of snapdragon that would tolerate the windy conditions where I live in Newport, Rhode Island, and one that could be used as a cut flower in addition to holding up in a border throughout the season. Susan recommended the Carioca series sold by Stokes. They are a medium height, 20 in., come in separate colors and don't need staking.

Many catalogs list only one variety of certain annuals such as statice or feverfew; Stokes lists several varieties for each. There are also many varieties of single marigolds listed, a rare find.

Catalogs are a great aid in garden planning. I spend long hours designing the perfect perennial border with the help of catalogs from The Garden Place, Martin Viette's Nursery and Wayside Gardens. The Wayside catalogs, both spring and fall, continue to be fine reference guides with many color illustrations. I have received healthy, vigorous plants each time I order from The Garden Place in Ohio. *Martin Viette's Perennial Catalog and Handbook* contains special use lists. Viette does not ship but the handbook is worth the $3.00 cost and Long Island really isn't so far from Philadelphia. The Garden Place catalog includes height and color lists that are easy to cross reference with the descriptions of each plant.

The Viette catalog includes lists of long blooming perennials, plants suitable for cutting, plants for specific locations and many varieties of the "sensational six": iris, peonies, poppies, daylilies, phlox and chrysanthemums. A generous number of color illustrations are included.

Other catalogs are handbooks too. *Rhododendrons for the Connoisseur,* the Baldsieffen Nursery catalog, is a complete handbook on rhododendron culture in addition to a plant list. Full descriptions of each plant offered and many color photographs illustrate the handbook.

Engaging color illustrations in the Putney Nursery catalog will convince you that a woodland garden is a must. Many ferns and wildflowers, most for shady locations, are described. Over the past few years, I've noticed a decrease in the number of wildflowers offered by Putney and an increase in the selection of border perennials and herbs. The graceful Scottish harebell, *Campanula rotundifolia* and several species of ferns are among the plants I've grown successfully from the Putney Nursery.

The geranium craze seems to wax and wane over the years. From the number of ads and articles appearing in garden magazines it appears that geraniums are once more sought by gardeners and specialty plant collectors. The fancy leaved and scented types are very popular and Carobil Farms in Maine offers a number of varieties. For the specialist Carobil even offers some micro-miniatures at $12.00 a plant! The old standbys are also listed and I was happy to see that the rainbow hued 'Skies of Italy' and 'Mrs. Cox' are still on the list of fancy leaved geraniums.

A yellow-flowered terrarium begonia, *Begonia prismatocarpa,* is one of the stars on the list of more than 300

by Julie Morris

The *Leonard Horticultural Tool and Supply Catalog* lists the handiest small pruning shears I have ever used. . . . I buy them three at a time and always have them at hand along with my cutting knife.

begonias grown by Michael Kartuz in Wilmington, Massachusetts. Kartuz also grows hundreds of gesneriads from the large leaved streptocarpus to the miniature gloxinia, *Sinningia pusilla*. General cultural suggestions are included and the catalog also has a keyed cultural guide, a simple reference to each plant's requirements.

Tillotson's Old Roses nursery is still in Dorothy Stemler's family but under a new name. *Roses of Yesterday and Today* is the title of the new catalog, which to all appearances is identical to the old catalog. The full descriptions include the cultural needs for each rose. The catalog lists such hard to find roses as *Rosa banksiae,* the subtropical rose suitable for greenhouse culture and the old Damask roses. The list includes Souvenir de la Malmaison, the rose growing in PHS's 18th Century Garden.

Over the past several years, vegetable gardening has given rise to a renewed interest in herb gardening. The Meadowbrook Herb Gardens in Rhode Island ship over 120 different herbs to gardeners around the country.

A natural companion to vegetable and herb growing is fruit culture. Most gardeners run out of growing room long before they run out of steam and enthusiasm. The espalier fruit trees offered by Henry Leuthardt in his Long Island nursery save space and can easily be worked into a small garden scheme. His catalog/handbook is interesting reading. The nursery has a limited number of espaliers of any one kind so a season's wait is not unusual.

The *Leonard Horticultural Tool and Supply Catalog* lists the handiest small pruning shears I have ever used. The Corona mini-shears fit easily into a pocket and are perfect for pruning houseplants or deadheading garden flowers. I buy them three at a time and always have them at hand along with my cutting knife.

Each spring the seed catalogs herald the coming season with great fanfare as the new plant introductions are made, the All America award winners announced and each nursery extolls the virtues of new and improved varieties of the thousands of plants they offer to the gardening public. Yearround I look forward to the catalogs I've come to rely on, among others: the forcing edition of the Scheepers bulb catalog to see me through gray winter days, the catalogs from the Rock Garden in Maine and Spruce Brook Nursery in Connecticut—each offering something new to tuck into a corner in the garden. I long for acres of gardens when I read the Blackthorne Nursery's list of lilies for summer long bloom. I am lucky because what I can't fit into my own garden I can usually plant and enjoy in one of the summer flower borders I take care of each year. Finally after frost each year I console myself with one of the tempting offerings from *Logee's Catalog of House and Greenhouse Plants*. This year I'm collecting jasmine.

Nursery catalogs are considered ephemeral material by most of us. The PHS library and other horticultural libraries recognize that catalogs are important chronicles of horticultural progress and have taken steps to ensure that where possible complete collections are maintained for each part of the country. PHS maintains a permanent collection of Delaware Valley catalogs and welcomes contributions of material published before 1920.

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Julie Morris is a partner in Summer House Garden Consultants. At present, she is also working as a consultant to a college in Rhode Island to help set up a full-time horticultural program. Morris was PHS librarian from 1970 to 1976.

Catalogs — A Selected List

Baldsieffen Nursery — *Rhododendrons for the Connoisseur* ($2.00)
Box 88
Bellvale, NY 10912

Blackthorne Gardens — Lilies ($1.00)
48 Quincy Street
Holbrook, MA 02343

Carobil Farm and Greenhouses — Geraniums ($.35)
Church Road, RD 1
Brunswick, ME 04011

The Garden Place — Perennials ($.50)
6780 Heisley Road
Mentor, OH 44060

Greer Gardens — Rhododendrons (including Vireya rhododendron, rare trees, shrubs) ($1.25)
1280 Goodpasture Island Road
Eugene, Oregon 97401

Kartuz Greenhouses — Gesneriads, Begonias
92 Chestnut Street
Wilmington, MA 01887

A. M. Leonard, Inc. — Tools
6665 Spiker Road
Piqua, OH 45356

Logee's Greenhouses — House and Greenhouse Plants ($2.00)
55 N. Street
Danielson, CT 06239

Henry Leuthardt Nurseries, Inc. — Espalier Fruit Trees ($.25)
East Moriches
Long Island, NY 11940

Meadowbrook Herb Garden ($.50)
Rt. 138
Wyoming, RI 02898

Putney Nursery, Inc. — Woodland Flowers and Ferns
Putney, VT 05346

The Rock Garden — Dwarf Plants ($.30)
Litchfield-Hallowell Rd., RFD 2
Litchfield, ME 04350

Roses of Yesterday and Today ($1.00)
802 Brown's Valley Rd.
Watsonville, CA 95076

John Scheepers, Inc. — Bulbs (forcing edition most useful)
63 Wall Street
New York, NY 10005

Southmeadow Fruit Garden (price list free; illustrated catalog $5.00)
2363 Tilbury Place
Birmingham, MI 48009

Spruce Brook Nursery — Greenhouse and Terrace Plants, General Lists ($1.00)
Rt. 118, P.O. Box 925
Litchfield, CT 06759

Stokes Seeds
Box 548
Buffalo, NY 14240

Martin Viette — Perennial Catalog and Handbook (no mail order)
Northern Blvd., Rt. 25A
East Norwich, LI, NY 11732

Wayside Gardens — Perennials ($1.00)
Hodges, SC 29695

PRESSED PLANT MATERIAL PICTURES

by Katharine H. King

This monogram was made as an expression of my appreciation to the Pennsylvania Horticultural Society, for the knowledge, pleasure and many friends I have gained through the Society. It was made of sycamore bark, maidenhair fern, rose foliage, rose petals, cornflower petals and buttercups.

My friends, Mr. & Mrs. J. Liddon Pennock, collect lizards, so I made this lizard for them with a large green leaf and hydrangea petals, punched with a hole puncher. The plant on the right is made with the skeleton of a Queen Anne's lace flower and Mexican sunflower, also punched with the hole puncher.

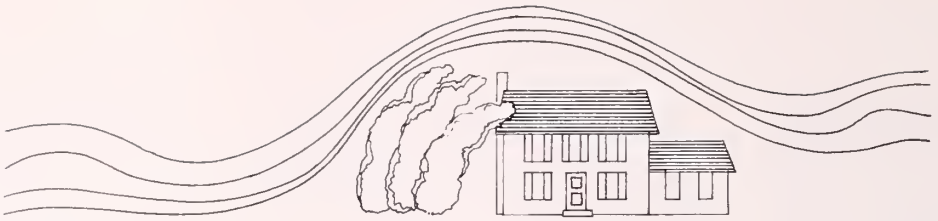
This is the crest of Princess Grace of Monaco. The crown is made of tulip petals. The stones in the crown are from delphinium and rose petals and parsley. The two G's (Grace and Grimaldi) are punched from tulip petals, which look remarkably like gold. I had great difficulty enlarging it to 6 in. x 8 in. from the ¾-in. sample I had on her stationery.

This traditional picture was donated to the Grand Auction for the benefit of Chestnut Hill Hospital. The clusters are buttercups.

Katharine H. King has twice won the Helen Hope Deckert Award for the best arrangement in the Spring Show. At other times she has won the PHS Arrangement Sweepstakes and the PHS Pressed Plant Material Award for the Best of Show. She is a member of the PHS, Garden Club of America and The Weeders.

This was made for the Harvest Show several years ago in a class calling for foliage only. The materials are ferns and rose foliage. The rose foliage is placed, under side up, as I felt the veins lent interest to a very simple design.

Entry in the 1970 Philadelphia Flower Show, used the following year by George Robertson Sons Florists in their advertisements.



The Role of Plants in Today's

It is a tribute to the adaptability of the American public, but also unfortunately to its short memory, that what is called "the energy crisis" arouses little worry today. Once the long lines at the gas stations disappeared, public concern and attention drifted to other matters. Few people realize that our national dependence upon imported oil has accelerated rather than decreased since the Arab embargo. Fewer still realize that our domestic oil wells are running out and that in time even the huge underground reservoirs of the Arab nations will do so too. Already one of the first strikes in the North Sea has been exhausted, and the problems of exploiting others in that storm-wracked area are even more formidable than had been at first predicted. The oil industry, grappling at the moment with a temporary glut, is in no mood to preach conservation. Yet the ominous truth is that shortages are coming in the future, that will be so stringent they will make the past shortage look like a time of profligate abundance.

Estimates vary considerably as to when the real crunch will hit, but nobody disagrees that it is coming. The Federal government's solution to the problem is to levy sizable extra taxes on oil and gasoline to force users to conserve available supplies for as long as possible. The shortages coming in the future and the sharply increased costs of petroleum products, which will occur in the immediate future, are both compelling reasons to plant for energy conservation. As yet, no one has seriously promoted the dual benefits of proper planting: conserve energy and promote beauty. The dollar savings are not immediately evident, but, as the plantings increase in size, their effectiveness increases year after year, a situation not typical of other home investments.

Whether homes are heated by electricity, coal or oil, heat is one major source of energy consumption. Infinitely more homes are heated by oil than by other energy sources, and dwellings are wasteful users. When oil was cheap and, in the public mind at least, inexhaustible, it was much cheaper to put in a big furnace and buy the fuel needed than to make houses efficient energy conservors. We are now saddled with millions of poorly insulated houses, constructed during the past and present housing booms.

Reconstruction, with the installation of effective insulation, is essential, and equally important is the establishment of efficient wind barrier plantings. Fortunately, much of the necessary basic research has already been done in the Plains States—some at the Agricultural Experiment Station, Kansas State University, Manhattan, and some at other locations.

I have observed living snow fences of wild roses and hawthorns along snowy Ontario highways that were full of feeding pheasants and Hungarian partridges.

We know that shelter plantings have a remarkable effect in reducing wind velocity and heat loss from homes. On the lee side of shelter plantings, even those composed of deciduous species (which lose their foliage in winter), daily temperatures are four degrees higher than those in exposed areas. Evergreen plantings have, of course, a much more dramatic effect.

In South Dakota, the fuel consumption of identical experimental houses was 25% less in a house located on the lee side of a tall windbreak than in an exposed house. If the house was sheltered on three sides but exposed on the south side, the wind reduction was 71%, and the fuel consumption was reduced by 40%—a truly remarkable saving. Other experiments have shown comparable effects.

In small experimental houses warmed by electric heaters, which can give very precise records of fuel consumption, the fully exposed house required 442.6 kilowatt-hours to heat it to 70° for the month of January 17 to February 17. Its identical counterpart, which was sheltered by a windbreak, required only 270 kilowatt-hours to be held at the same temperature during the same 30-day period. The difference in the average fuel consumption for the entire winter was 33.92%.

fuel savings

One would expect such remarkable effects in the windswept plains country. In the more sheltered eastern states, which are not subject to such constant fierce winds in winter, the energy savings are less dramatic. In one eastern calculation, which compared the fuel consumption in the same house before and after an evergreen windbreak reached the height of the house, a saving of 10% per winter over the former exposed condition was recorded.

In terms of national fuel consumption, the eastern experience is much more significant, however, because there are thousands of houses in the East for every one on the Great Plains. Even a 5% reduction of fuel consumption on the eastern seaboard would save much more fuel than the total consumption of all the Plains States combined, because so many millions of houses are involved.

Indeed, shelter planting repeated on a very large scale can have an effect on the climate of a very substantial area, as has been very graphically demonstrated by M. Jensen, a Danish meteorologist. He recorded wind speed along two lines across Jutland from the North Sea in the west to the Baltic in the east. The southern transect was across open countryside with few hedges, the northern one across a landscape crisscrossed by hedges and dotted with small patches of woodlands. Observations with anemometers were made on days with strong westerly winds of approximately 40 mph on the western coast. The winds inland were reduced by only a third of their velocity in the more open area but by half in the sheltered one, a difference of 6 mph between the two. The northern area was significantly warmer than the southern, especially during the windy months of winter

Energy Conservation

by William Flemer, 3rd

when heating fuel consumption was at a peak.

The location of a windbreak is, of course, the key to its effectivenss. Most of our cold winter winds throughout the nation come from the north or the west. Therefore, windbreaks should be located on those sides, with an extension on the eastern side wherever space permits. The southern side should be left open to permit the sun to enter. The sun lies low in the southern sky in winter, but an open southern exposure permits the yard and house to absorb the heat. Experiments with anemometers show that the maximum wind reduction appears at a distance of from four to six times the height of a windbreak, so plantings should be established at this distance from the house. Rapid-growing species should be chosen, ones that reach from one to 1½ times the height of the house at maturity. A 20-ft. high house would benefit most from a hedge of tall evergreens located 80 to 120 ft. from the north side of the house. A single row of evergreens is effective, but a double or triple row is even more beneficial.

solid walls less effective

Initially, a tall, solid wall of masonry or wood might appear to more effectively reduce heat loss than a hedge of plant material through which some wind does pass, especially when the velocity is high. The solid barrier, however, lifts the wind up over itself and creates great turbulence on the lee side. A hedge or barrier planting, on the other hand, permits enough wind to pass through so that "spoiling currents" are formed, and they dampen and cancel the force of the downdraft. The result is a maximum wind reduction, which has been clearly proven in Great Britain.

For generations, the Isles of Scilly, to the south of England, have had a specialized agriculture, capitalizing on the mild temperature to produce early flowers and vegetables for the mainland markets. The great obstacle to horticulture on these islands has been the severe gales that blow in from the open sea. The early solution to these problems was to shelter the little flower fields with densely sheared hedges. Without this protection, flower culture was hopeless, even though the overall temperature was not severe.

In the first part of this century, some growers thought that they could save much space (as well as the cost of maintaining the hedges) by substituting solid wooden fences. In the worst storms, these fences often blew down or broke up. But, even where they held firm, they created such turbulance behind them that flowers and delicate vegetables like lettuce were unsalable. When the hedges were reestablished, the problem was solved again. Under today's American conditions, plant barriers are far cheaper to install than any other kind of fence, and, if appropriate plants are used, future maintenance is negligible. For once, the least expensvie material is the best for the purpose—a rare occurrence around the home.

Winter and summer are the two peak periods of energy consumption in both homes and commercial buildings. In winter, heating consumes energy; in summer, air conditioning also makes enormous demands on our power-generating facilities.

modern design wastes energy

The shortsighted and stupid trend of modern office design has made the problem still worse. Most modern office buildings are now fashionable cubes of glass, whose huge transparent walls create a greenhouse effect. The resulting accumulation of heat makes the interiors intolerable in summer unless they are air-conditioned. To compound the problem, incredible though it seems, most of these buildings have hermetically sealed windows that cannot be opened, no matter how hot it becomes. Happily, properly sited shade trees can improve the situation enormously for buildings up to 60 ft. or so in height.

Trees are, after all, nature's air conditioners, and they have been doing the job well for countless centuries. Entering a woodland on any hot summer day shows the job trees do, without any elaborate instruments to prove it.

Deciduous shade trees come into leaf in late spring, when the daily temperature begins to climb. All summer long, they absorb the sun's heat, and, at the same time, they transpire cooling water. In the fall, when the temperature drops, the leaves shed automatically, and the sun can fall on house or office walls, adding its heat to that produced by the furnaces inside.

Properly shaded houses have little need for costly air conditioning. Even when air conditioners are installed, they need to work only half as much to do their job in a shaded house compared to one on which the sun beats down unimpeded on walls and roof. Differences of 8° have been recorded between shaded and unshaded oudoor surfaces.

location of plants important

Obviously, shade trees should be planted on the south and west sides of a building to do the best job of cooling. In really cold climates, those species with compound leaves are especially effective, because they have fewer and coarser twigs than those with simple foliage. Ashes, honey locusts and Kentucky coffee trees are examples of trees with large leaves and relatively few twigs. Ashes have the added advantage of being among the last trees to leaf out and the first to defoliate—a benefit in cold areas.

In addition to trees, deciduous vines have a tremendous effect in cooling walls in summer. For masonry walls, clinging species, like Boston ivy *(Parthenocissus tricuspidata)* and Virginia creeper *(P. quinquefolia)* are excellent cooling devices. Their leaves are borne in an orderly shingle pattern on 4- to 6-in. petioles. The leaf blades intercept and absorb the rays of sunlight, while behind them a convection current carries the warm air up and away from the wall. Deciduous vines are most effective on southern and western walls, which receive the full heat of the sun

continued

Plants in Energy Conservation continued

in summer. Evergreen species, like English ivy *(Hedera helix),* are effective on sunless north surfaces, where their persistent foliage deflects wind in winter and their stems have an insulating function.

Clinging vines are not good for wooden walls, because their stems and tendrils hold moisture and cause the wood to deteriorate. The same cooling effect, however, can be obtained by training twining vines, like wisteria or climbing roses, on trellises. The trellises can be detached and swung away from wooden walls when they need painting and then pulled up in place again. Since the vines do not touch the wooden surface, they do not hold moisture against it, and indeed, they slow down the deleterious effect of summer sun on paint surfaces.

In tropical areas, where cooling is desirable throughout the year, evergreen clinging or twining vines are useful on all walls exposed to direct sunlight. Climbing fig *(Ficus pumila)* and the many other permanently evergreen species work well in cooling exposed walls.

living snow fences

Less obvious than the foregoing is the role of planting in snow control. When blizzards sweep across the nation, highway snow removal is costly and time consuming. Properly located border plantings, established at the correct distance from a highway, catch snow and hold it in vast drifts on the highway right-of-way at a safe distance from the roadbed itself. Such living snow fences are particularly valuable at the edges of roads that run through deep cuts in open country. These cuts, in blizzard conditions, can fill solidly with of snow, most of which must be laboriously plowed away or, in extreme conditions, actually loaded and hauled out in dump trucks.

In many areas, wooden snow fences are used extensively for drift control. However, they must be laboriously erected each fall and removed for storage in the spring.

At planting time, living snow fences are not only comparable in cost on a per foot basis with new wood and wire fences, but they last for many decades. Furthermore, instead of wearing out in a few years, they increase in height and density each year and actually become more effective. Such living snow fences established 20 years ago on portions of the New Jersey Turnpike have given trouble-free service each winter and now work twice as well as they did when younger.

photos supplied by Princeton Nurseries

Shelter planting for a home site. This 15 ft. trimmed arborvitae hedge is planted along the west side of the property. It reduces fuel consumption in the winter and greatly increases the period when the garden can be enjoyed in both spring and fall.

Naturally, from an aesthetic point of view, they are an enormous improvement over miles of wooden fence, and the "edge effect" they create is a superb wildlife habitat, providing food, shelter and nesting sites. I have observed living snow fences of wild roses and hawthorns along snowy Ontario highways that were full of feeding pheasants and Hungarian partridges.

parking lot use

Screen plantings of tall conifers can work wonders in reducing the cost of plowing out parking lots when blizzards strike, particularly if the parking areas are sunken and accumulate deep drifts. Screens must be set back far enough so that the drifts that form behind them accumulate on the bordering banks or grass areas rather than on the pavement itself. Not only do such screens deposit the snow where it does not require machine removal, but they also act as sun traps when clear weather returns and hastens melting and runoff on the paved areas.

Not all parking lots are so located as to capitalize on the benefits of snow control by judicious planting, and, of course, there are countless ones in southern areas where snow is not a problem. However, the benefits are so striking where the terrain and climate are appropriate that site planners would do well to keep this method in mind.

conserving moisture

Still another benefit from strategically located shelterbelt plantings is the conservation of soil moisture during the hot summer months. That is of great importance to farmers, orchardists and nurserymen, although not of much interest to the general public. Moisture conservation is, of course, the reason why the great shelterbelt programs were undertaken in the western USA and Russia and why a similar enormous operation is now going forward on the bleak plains of inland China. As any farmer knows, it is the combination of hot sun and strong winds that dries out the soil and causes extended periods of water stress in cultivated crops.

Shelterbelt plantings reduce wind velocity greatly for a distance of 10 times their height, but they still have some effect at a distance of 50 times their height. In windswept, semiarid regions, their presence can mean the difference between a partial crop and no crop at all when conditions are

severe. Less obvious are the benefits in well-watered areas with adequate rainfall. Even here, periods of plant stress occur in summer whenever constant winds and clear skies coincide. I remember well being shown two fields of one-year-old peach trees in a nursery in southern France. One was located in rented ground in the middle of a large wheat field, and the other was in a nursery field surrounded and bisected by the traditional Italian cypress windbreaks so common in that area. Both fields were irrigated by deep wells and portable pipes, and the logs of the wells showed twice the pumping for the exposed field as for the sheltered one. Despite the lavish use of water on the former, the trees were only 2 to 3 ft. tall, whereas those in the sheltered field were 4 to 5 ft. tall. Twice the pumping and pipe-moving costs had produced a crop a third less in value at digging time.

It is true that planted windbreaks occupy ground that would otherwise be available for crops. But, in high-cost and high-yield crops like nursery stock, the sacrifice of productive area is worthwhile.

renewable source of fuel

Finally, wood is the only renewable source of fuel that exists, unless we consider the rays of the sun to be "fuel." For the countless ages since man discovered the use of fire for heating and cooking, wood was the only major fuel. In the context of that vast time frame it was only yesterday that we discovered the three big fossil fuels —oil, coal, and natural gas—and they will be gone tomorrow. The wood stove effectively heated the homes of our rural ancestors and the far better engineered stoves of today are being "rediscovered" as a much cheaper heat source than any other alternative. One five-room house in our area with both an oil furance and a modern Norwegian wood stove has been heated for a total oil cost of $40.00 till the middle of February a year ago.

To be sure it is inconceivable that the packed masses of people who live in our big cities can be heated in winter by the use of wood. However, some fairly sophisticated computer simulations have shown that towns and small cities in more rural areas can be heated in perpetuity with wood grown on a sustained yield basis in town forests, with additional income from the use of superior logs for lumber. We always seem to need elaborate methods to discover the obvious these days, while the experience in Germany, France, and even in 18th century America shows that it has been done for centuries. By applying modern scientific understanding of the mechanics of combustion, it is possible to extract far closer to the theoretical 100% of the heat contained in wood than was possible in the more primitive stoves and fireplaces of the past. In any case, inexpensive heating with wood is a viable alternative to the skyrocketing costs of oil for a significant part of our population who live in the naturally forested portions of this country.

Wood is a surprisingly adaptable material with unexpected utility. When I was in Europe during the summer of 1944 and in 1945, trucks, cars, buses and farm tractors in the occupied countries ran on wood. They were fitted with cylindrical combustion chambers similar to small hot water boilers, which were filled with wood chips. The chips were slowly and incompletely burned, producing methane gas, which was the propellant used in the cylinders of the engines. The horsepower was very low compared to modern high octane gas, but the gas was clean, motor maintenance was negligible and, of course, it was non-polluting. It is not likely that the gas station of the future will be selling wood chips, but it may well sell or fill little cylinders of methane or propane gas obtained from large-scale wood distilling factories, which would produce other valuable byproducts of the process as well. Wood is also an alternate source for many of the essential industrial hydocarbons now manufactured from crude oil. So long as the oil was selling for 90 cents a barrel in the Middle East, wood could not compete. With oil at $14 per barrel the price gap has greatly narrowed, and as oil becomes scarcer its price is bound to rise. Wood is available in perpetuity if grown and harvested on a sustained yield basis.

If the house was sheltered on three sides but exposed on the south side, the wind reduction was 71%, and the fuel consumption was reduced by 40%. . .

We are only now beginning to see the same kind of first steps in tree breeding that led to the fabulously productive grain crops of today. The most primitive corn known produced only a few bushels of grain per acre, and its ancestors yieded even less. One hundred bushels per acre are routine crops today and the 200 bushel yield is being crowded. Forest tree geneticists have already bred trees that grow three times the annual wood production per acre compared to unimproved wild trees of the same species, and they are confident of producing still better strains.

Forest trees are really the only substance that can capture and store the sun's energy in convenient form for our use in the future. Only 10% of the forested land in this country today produces 80% of the forest products we use. The rest is productive land, but covered with cut over scrub and mostly stocked with a preponderance of inferior "weed tree" species. For generations our national forest policy has been to cut out the best trees on a periodic basis and leave the culls and genetically inferior trees to reproduce and restock the land. The future of an efficiently managed forestry program is very bright indeed.

Proper and skillful planting is no panacea for all the nation's energy problems, and it would be a gross exaggeration to make such a claim. Besides its many other benefits to spirit and body alike, however, planting can make long-lasting contributions to both the conservation and the production of energy.

●

William Flemer, 3rd is president of Princeton Nurseries in Princeton, NJ. A third generation nurseryman, his particular interest is plant breeding and the genetics of shade trees. He's a member of the board of directors of the Arnold Arboretum, Harvard University, a fellow of the Royal Horticultural Society, as well as a member of other related organizations. He has written two books and numerous articles about trees and shrubs and has lectured in this country and abroad on plant propagation, woody plant breeding and shade tree selection and use.

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zephyranthes candida

I bought my zephyranthes at the Philadelphia Zoo plant sale in 1976. This bulb is a native of South America and has long, slender, neat dark green leaves and white crocus-like flowers in late summer and early autumn.

The original bulb has increased to four, and the number of blooms from one in 1976 to 15 in 1978. For the last two seasons there have been two periods of bloom, late July and again in late September. During cool September weather the flowers lasted for about 10 days, those in mid-summer lasted only a matter of three or four days.

My zephyranthes set seed in 1977 but I was unsuccessful in germinating it. In 1978 I sowed the seed as soon as it was ripe, directly onto the surface of the parent pot. I covered the seed with a pebble mulch and most of the seed germinated within a month. The surface of the pot is covered with dark green grasslike leaves of new plants.

Another zephyranthes, *Z. rosea*, was offered at the 1977 PHS plant giveaway. These seedling bulbs should be of blooming age next summer, and I would be interested to hear from other growers.

This pleasing flowering plant is easily grown in the house, thriving in a hot dry atmosphere. I keep my plant rather dry in winter, but it does not go dormant like many other flowering bulbs. It multiplies readily but does not require a large pot. Its slender upright foliage can be accommodated in a very small light space.

Jane Reed Lennon

Jane Reed Lennon is interested in growing both tender and hardy bulbous material from seed and finds the process rewarding. Lennon is sitting gardens coordinator for the Philadelphia Green project.

photo by Patrick Rodebaugh

saintpaulia sp.

About the end of January 1978, I decided to propagate a leaf from one of my African violets because I liked the color of the flower and wanted more plants.

I potted up the leaf in plain vermiculite, set it on my kitchen windowsill, which gets afternoon sun, and kept it moist. Within a few weeks the plantlets began to appear.

About the third week of March, I noticed a flower bud and stem had grown from among the plantlets. The bud began opening and was fully open by March 31. I had used only the vermiculite and no fertilizer.

JoAnn Ellis

JoAnn Ellis grows African violets as a hobby.

photo by Michael Ellis

Longwood Gardens-

Attending to the Home Gardener's Needs

Balcony platforms embellished with plants create the feeling of hanging gardens in the new Example Balconies at Longwood Gardens.

by Jane Pepper

If you were asked to describe Longwood Gardens to prospective visitors you might mention open sweeping lawns, large, old trees, ponds filled with exotic water lilies, an open-air theatre, an enormous conservatory filled with hanging baskets of fuchsia, cascading chrysanthemums, highly scented lilies, or a mass of spring bulbs depending on the season. From your account these visitors would be prepared to see horticulture on a large scale, which would probably have little in common with their garden back home.

These large, beautifully-maintained displays make Longwood a very special place to visit. There are few gardens where, year-round, so many people can enjoy such beauty and elegance. The large scale of the property has, however, always posed a problem for staff members at Longwood Gardens who, in addition to providing beautiful displays, seek to provide visitors with horticultural information that they can use in their home gardens. This goal is difficult, however, because elaborate fountains, a quarter mile of flower border, or large rose gardens are just not what most of us fuss over in our suburban plots, city apartments or condominiums.

example gardens open, 1973

When the old Azalea House was rebuilt, the management attempted to rectify the situation and included an area specifically geared to the home gardener. In 1973 the first set of Example Gardens was opened to the public. Since the display area is under glass the situation is somewhat unreal for displaying outdoor gardens; on the other hand, visitors can enjoy them year-round.

Four landscape designers were invited to present solutions to one home landscaping design problem: the entryway to the home. Longwood Gardens staff members installed the four small gardens in the new Azalea House, and made available copies of each architect's interpretation of his plan, his plant list and a cost estimate. The staff hoped that visitors would find design and planting ideas in these installations to help them with their home gardens. In addition Longwood wished to make visitors familiar with the names and design approaches of several landscape designers in case they required professional help.

In succeeding years other design problems have been tackled, and other landscape designers invited to submit plans. Each year the installations had one main thing in common—they presented ideas and inspiration for those with gardens. Still, the many apartment and condominium dwellers who visited Longwood were not being served adequately.

The people at Longwood were aware of this, but no one had been able to come up with a solution to the problem that was compatible with the budget. Constructing a house facade is expensive, an experience encountered frequently by the garden clubs at the Philadelphia Flower and Garden Show. There seemed little hope of gathering enough money to build a structure that would simulate apartment living, unless the staff could convince the Board to double the Example Gardens budget in 1978, and leave the installation in place for two years. The Trustees were enthusiastic about the idea. In March 1977 Landon Scarlett, Longwood's display coordinator; Bill Thomas, visitor education coordinator; and other key members of the Horticulture, Maintenance and Education Departments formed a committee to discuss the 1978-79 Balcony Gardens.

1978-79 balcony gardens — planning the structure

The Committee decided that instead of having four completely separate gardens as in most previous years, they wanted a series of balconies combined in one structure. Therefore, instead of inviting several landscape designers to present design ideas and planting plans,

they asked one architect to design the entire structure. The planting plans were to be done by Longwood staff members. Don Homsey, from the architectural firm of Victorine and Samuel Homsey in Wilmington, became a vital member of the team.

For Don the challenges were several: to present as many different "gardening in apartment" situations as possible within approximately 2,400 sq. ft.; to unite these situations in an attractive framework compatible with the elegance of the Azalea House and the adjacent Conservatory; to provide a structure with good circulation for both pedestrians and wheelchairs; to design an elevated structure that was capable of withstanding heavy loads—and yet to stay within the $25,000 budget allotted for architectural fees and materials. (When final costs were established, $21,750 was spent on the above items. All the labor and other professional services were provided by Longwood Gardens employees or members of the Advisory Committee.)

In an effort to provide the widest possible variety of apartment gardening situations, Don's plans called for balconies, window boxes, windowsills and shelves, a bay window with supplemental electric light and a fluorescent light installation. Varying light exposures and typical apartment overhangs were included to help visitors realize they can garden even within such limitations.

structural materials

Once the preliminary plans were approved, the hunt began for structural materials, fixtures and fittings. Where possible, the Committee wanted to simulate typical apartment windows, railings and floors. As Don said "these elements were not supposed to be the most beautiful, but they had to be items to which many visitors could relate." Similarly, lighting tracks and window shelves were to be surface-mounted since most apartment dwellers would be unlikely to add permanent, covered fixtures in a rented dwelling.

Three different sets of windows were chosen. One set, similar to those often installed in garden apartments, are sliding windows, another is double-hung, and the third an old set of windows with wooden frames and deep windowsills. Don rescued these windows from the Carpenter House in the outskirts of Wilmington as the demolition crew waited outside with crane and wrecking ball. (Mr. Carpenter was a president of the DuPont Company.) The cast ironwork for one balcony was another piece of discarded property, saved from a Victorian house on the Abondi property, now part of Longwood Gardens. By coincidence, the ironwork in the Longwood storage barn was within a few inches of being the right size for the balcony Don had designed, unaware that the ironwork existed. Stock item balcony railings were used throughout the rest of the display. These are all alike, which helps to unify the overall structure. Two of the balconies have flagstone floors, the others simulated concrete.

Thanks to the great snows of '78 things almost went awry during the last week. The six days the Horticulture Department had to install the plants were cut to three, so everyone just worked harder.

By careful handling of materials Don has succeeded in controlling the visitor's mood as s/he moves from outside the simulated apartment building to the interior. On the exterior the walkway is exposed aggregate concrete slabs, on the interior carpeting. The interior walls are painted with a smooth finish, the exterior appears to be stucco—in fact it is sand-painted plaster board.

With the basic structure on paper the Committee was in a position to tackle the detailed presentation of the four different apartment gardening situations: balconies, window boxes, the "interior," windowsills or shelves, and the areas with supplementary growing lights.

balconies

Being an apartment dweller herself, Landon is well aware of the complaints that can come from neighbors or apartment owners who may be unsympathetic (sometimes justifiably) to your gardening activities. Thus all balcony planters were designed with drip pans, and the safety factor was carefully considered. Several attractive possibilities for hanging baskets or suspended planters were discarded because the Committee only wished to demonstrate realistic, good-neighborly situations. Those pots and planters that are attached to the exterior of the simulated apartment building are very securely fastened.

A theme was chosen for each balcony: "City Form," "Victorian Moods," "Gardener's Balcony," "Dining Al Fresco," and "A Balcony for All Seasons." For some of the balconies the Horticulture Department selected plants that would, with care, probably survive a Delaware Valley winter outside in containers. Annuals and tender potted plants brighten these displays in summer. A small dogwood was selected in the nursery for the north-facing "Balcony for All Seasons" and containerized in the fall for use when the display opened in February. Bergenia was chosen as a heavy-textured plant to offset the more delicate Nearing rhododendron (*Rhododendron* x 'Windbeam') on the same balcony.

Although not a great deal is known about the subject, it seems that the greatest challenge to winter survival of containerized plants is root hardiness. Roots of plants growing in containers are exposed to lower temperatures than those of plants grown in the ground. To help moderate the extreme temperatures, many of the containers, including the window boxes, are insulated with ¾-in. styrofoam.

Of the balconies, the "Gardener's Balcony" has probably proved the greatest challenge to the Horticulture Department. During the winter the balcony is enclosed by a structure with wood supports and lucite glazing panels, which successfully becomes a greenhouse. Supplementary heat is provided by radiant heat panels to keep the temperature at 45°F. Come spring the panels can be dismantled and the gardener can pursue his interests on a sunny balcony. This balcony, unlike the others in the display, faces south, and the Committee had hoped to exhibit a wide variety of vegetables growing in containers. Unfortunately the superstructure of the Azalea House caused a greater light reduction than they had anticipated. In July the pole beans were stringy with few flowers, the tomatoes had to be changed every few days, and the most successful spring vegetable had proved to be leaf lettuce—rather too ordinary for the tastes of the members of the Horticulture Department.

continued

"Victorian Moods" balcony

windowboxes

Two sets of window boxes were made up for each window. These are alternated from growing house to display area to allow for changing displays and so every visitor may see the boxes in prime condition. In July, zucchini were dripping from one box, another was planted with herbs such as sage, parsley, mint and rose geranium, and in the sunniest position, two boxes full of tender succulents made a fascinating exhibit. For apartment gardeners with hot sunny conditions who may not be able to slip home to water their plants during the lunch hour, Landon considers succulents ideal window box plants. A double box—the interior one with handles—enables the gardener to place the whole box inside during the winter if the plants are not hardy in this location.

interior displays

An interior sill of one of the south-facing windows is also filled with cacti and succulents (see photo). In an east-facing bay window, mercury vapor lamps provide supplementary light for plants such as coralberry, grape ivy, sword fern and spotted dracaena. One dark corner is filled by a beautiful false aralia, surviving almost entirely on the rays from one Wonderlite, a self-ballasted mercury lamp.

For the "interior" displays the challenge has been to find indoor plants that will do well in the Azalea House where temperatures go as low as 45°F at night during winter. A collection of miniature geraniums still looks well after six months on display; other plants are moved to the growing house when they look ratty, and reappear in top condition a few weeks later. Most home gardeners would not have to cope with such low night temperatures and the selected plants should do well throughout the year, given the proper exposure.

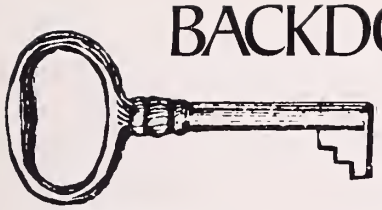
building and planting schedule

The six weeks preceding opening day on February 14, 1978 were frantic. Not until January 2nd (after the Christmas rush) could the crews dismantle the 1977 Example Gardens. Then, teams of painters, carpenters, plumbers, stonemasons and electricians swarmed onto the site. Where possible they had precut, precast and preassembled various sections, but the schedule was still very tight. Everyone felt the pressure, but a tremendous esprit de corps developed between the many individuals with one common goal—to finish in time for the Press Opening on February 14th. Thanks to the great snows of '78 things almost went awry during the last week. The six days the Horticulture Department had to install the plants were cut to three, so everyone just worked harder. J. Liddon Pennock, Jr., a member of the Advisory Committee, braving the snow like everyone else, would arrive at Longwood by 7:30 a.m. each of those final three days to help with the finishing touches.

Finally it was—well—in sufficiently good shape, Longwood style, to pronounce the 1978 Balcony Gardens open to the public. They come, they look, they talk, some even write letters with suggestions that prompt more changes. The exhibit is never completely finished and, for the gardener who visits Longwood frequently, this makes every visit a new experience. For the vacationers stopping en route from Washington to New York, Buffalo to Atlantic City, there is enough to digest in the Balcony Gardens alone to keep them busy at Longwood Gardens all day. In fact I think they would be smart to plan another stop on their way home.

●

Jane Pepper graduated from Longwood Program in Ornamental Horticulture at the University of Delaware in June 1978. At present she is contributing editor to *Plants Alive* and secretary to the Haverford College Arboretum Association.



BACKDOOR TO PLANT IDENTIFICATION
Part II - How to Use a Key

by Emily Kneebone

It has been said that one good way to teach people to swim is to shove them into deep water. I never gave swimming lessons that way, but I like the idea as applied to the teaching of other things, such as the use of botanical keys. What I am shoving you into may seem to be over your head, but I promise you'll be swimming with some confidence by the end of this article.

My plan is to illustrate the use of keys by writing one for my young neighbor, Jennifer, who has expressed an interest in learning the names of plants. This key will be written with her interests and capabilities in mind, as any key is written for a specific reader or user. Jennifer is barely a reader as yet. So I will write it a little above her head and then help her with it for a time. The adult reader will follow the thought processes that go into the making of this simplified short key and, I hope, will understand how to use a more advanced one.

Jennifer will accept without question the name "key" for the piece of paper I am going to give to her, but for your benefit it would be well to define the word "key" in the sense in which it is used here.

Our old Webster's *Collegiate* defines the word in 13 different senses, the botanical of which is this: *"Bot. & Zool.* A table in which the salient characters of a group of plants or animals (or of species, genera, etc.,) are arranged so as to facilitate the determination of their names and taxonomic relationships." Another book defines keys as "sequences of alternatives." My own definition is not as succinct but I hope it is clearer: A key is a list of characteristics of plants, usually presented as pairs of choices that the reader applies to a plant to be identified, e.g., woody or non-woody. Each choice that is made eliminates the other choice in that set, and directs the reader to a further set to choose from, and from there to further ones until a final set provides the name of the plant or at least information leading to the name. My daughter, who occasionally babysits with Jennifer, says it is like a simple computer program.

Books on plants, if they have keys, also explain how to use the key. The author starts with the list of plants that are in the book and divides them into groups, which are then subdivided again and again until the final subdivision becomes a single plant. The sequence of alternative choices in the key applied to an unknown plant will lead eventually to the name of the plant.

The placement of a key in the front of a book provides the reader with an alternative to reading a description of every species in the book to try to find the name of an unknown plant. With a proper specimen of your unknown plant, you are immediately able to make a choice between two alternatives (e.g., woody or non-woody) and thereby cut out approximately half of the descriptions you would have had to read.

To construct a key, the author of the book has listed the non-woody plants under one part of the first set of choices in the key, and the woody plants under the other part, without regard to the order in which the plants' descriptions are listed in the remainder of the book. That is not immediately apparent to the learner but it is so nevertheless. Any few plants in which the woody or non-woody character could be doubtful are either placed in the key under both choices, or they are mentioned as being confusing at some point in the key.

After the author of the key has divided the list of plants into two groups, he or she then divides each group into two more groups, again by giving a set of choices. Suppose that your unknown plant is non-woody. You are directed to a second set of choices, perhaps "leaves narrow" and "leaves broad." You might be thinking now that narrow and broad leaves can be employed as a characteristic of woody plants, too, and you are right. However, by choosing the non-woody group you have already eliminated the entire group of woody plants. If a similar choice *is* used for the woody group, and it might be, it will be repeated elsewhere in the key, in the part that relates to woody plants.

"Narrow" and "broad" are general terms that might cause some uncertainty in a list of hundreds of plants. If the author of a key decides to use such terms as a set of choices, s/he will explain them specifically: "Leaves narrow—many times longer than wide," and "Leaves broad—not more than five times longer than wide." And then s/he would place *all* the non-woody plants in the book that have leaves more than five times as long as they are wide under the "narrow" choice.

Jennifer's key

The plants that I will use for Jennifer's key are the ones that grow in her front yard. The first step is to list them:

silver maple	Japanese holly
Japanese maple	pachysandra
spruce	grass
yew	dandelion
azalea	Mugho pine

Grass and dandelion have been included because they are two of the species in the yard, and, as species familiar to Jennifer, can serve as landmarks in the key for her.

Now for our first set of choices to split the list into two groups. The woody/non-woody set is a good one because these are characteristics that Jennifer can understand.

Our first pair of choices will be numbered *1.* (Some authors would differentiate the choices in each set by using *1a* and *1b,* or *I* and *II,* or picture symbols as in *Master Tree Finder.*)*

1. Non-woody plants – 2
1. Woody plants – we'll mark this "x" till we write more of the key and find out what number will apply.

The number "2" refers to the next pair of choices in the "sequence of alternatives." This next pair must refer only to the non-woody plants in the list. I look at the list to see which of the 10 plants comes under the category of non-woody, and find that there are three – pachysandra, grass, and dandelion. My second pair of choices, then, will be:

2. Leaves narrow
2. Leaves broad

Of the three plants, grass has narrow leaves, while pachysandra and dandelion have broad leaves. Therefore, the first of the number 2 choices gives the name of one of the plants

continued

*See box

How to Use a Key continued

—grass. Remember that the definition of key said "a series of choices leading to the name of a plant." The number 2 set then reads:

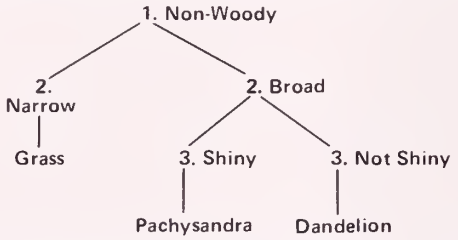
2. Leaves narrow — grass (end of identification of this plant)
2. Leaves broad — 3 (meaning see set marked with number 3)

In my number 3 set I differentiate between the last two plants in the non-woody group, pachysandra and dandelion:

3. Leaves shiny, thick, smooth, evergreen — pachysandra
3. Leaves not so shiny, thinner, not smooth, not evergreen — dandelion

All three non-woody plants have now been identified in a series of three sets of choices. The number to use for the "woody" choice, which we have marked "x" until now, is the next number available, which is *4*.

A diagram might help to clarify the process in your mind:



All the woody plants in the list are keyed out under sets of choices beginning with number "4." *Sets number 2 and 3 relate only to the non-woody plants in this list.* I could use any type of symbol to differentiate between pairs of choices; I have chosen to use numbers in sequence. Each set of choices is thus set apart from all other sets. Some authors use 2^1 or 22 for second (woody) group of choices. To me this is confusing.

Here is the way the rest of the key might be written (and the whole key so far):

1 Non-woody plants — 2
  2 Leaves narrow — **grass**
  2 Leaves broad — 3
    3 Leaves shiny, thick, smooth, evergreen — **pachysandra**
    3 Leaves not so shiny, thinner, not smooth, not evergreen — **dandelion**
1 Woody plants — 4
  4 Leaves opposite each other on stem — 5
    5 Lower branches 8 ft. above ground level — **silver maple**
    5 Lower branches only a few inches above ground — **Japanese maple**
  4 Leaves growing alternately out of stem or growing out all around stem — 6
    6 Leaves needle-like — 7
      7 Needles in bunches of 2 — **Mugho pine**
      7 Needles borne out one at a time — 8
        8 Needles sharp-pointed, stiff, scratchy — **spruce**
        8 Needles not as sharp-pointed, more flexible, not as scratchy — **yew**
    6 Leaves not at all needle-like — 9
        9 Leaves shiny, thick, smooth, dark green — **Japanese holly**
        9 Leaves not shiny, hairy, lighter green, and larger — **azalea**

Now suppose Jennifer points to the azalea bush and says she has forgotten what it is called. I am now ready with the key which will identify the bush for her if she will follow the steps, learn to make the comparisons called for, learn where to find the next set of choices in the sequence, and keep going until she arrives at the characteristic that presents the name of the unknown (to her) plant — azalea.

First she has to decide whether it is non-woody or woody. It is woody. This choice tells her to skip to the 4th set of choices, leaves opposite or leaves alternate. She looks closely at a branch of the azalea and finds that the leaves are alternate. The alternate-leaves choice directs her to go to the 6th set of choices, skipping over the 5th set which does not relate to alternate-leaved plants. The 6th set asks her to look at the individual leaves of the unknown plant and say whether they are needle-like or not, and she finds they are not. She follows the direction under the non-needle-like half of the number 6 choice and goes to set of choices 9. She examines a leaf of her unknown plant once again and finds it is not shiny, is definitely hairy, and is lighter green than the woody plants near it, and she has its name — azalea.

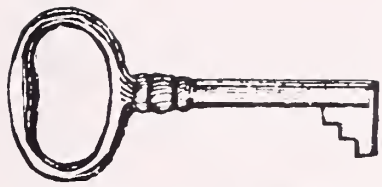
This process can be followed for every plant on the list. After Jennifer has used the key a few times she will not have to read every single comparison so laboriously but will be able to skip through rapidly to the name she is looking for. Eventually she will know everyone of the 10 plants on sight.

If you were to try to use this key in your own neighbor's front yard, you would find that it does not work because the lists of plants is different, and that means that the comparisons between the plants have to be different. Try to key out an oak tree (alternate leaves) in Jennifer's key. It comes out, all right — to be either a Japanese holly or an azalea. A look at botanical descriptions of both of these plants tells you immediately that you are in deep water. This is because the sets of choices in a key are based on comparisons between the plants *in the master list* (usually a book's index). Addition of one plant to the master list necessitates a change in the key. At first, more than half the time, an unknown plant that you are trying to key out will carry you to a place in the key where the key no longer makes any sense, that is, neither choice applies to the plant in question or both do, as in the case of the oak tree. When this happens, you know that you have made a wrong choice earlier (if the plant you are looking at is listed in that book). Wrong choices are made, not so much from ignorance on the part of the reader as from variability on the part of the plants. If you have a plant that seems hairy and the choice in the key is "hairy/non-hairy," you will naturally make a choice of "hairy." But since this is a highly variable characteristic, it may be that in that key, that plant should be keyed out under the other choice, simply because the average plant of that species is non-hairy. Chances are very good that you will run into another "hairiness" choice later in the key, even on the non-hairy side.

With practice in using a key over and over, you get a feeling for the occasional wrong turn, and how far back to go to try to make it come out. I know several people who have taught themselves to use botanical keys by practicing and asking questions. Practicing becomes enjoyable as skill increases, and the more skill you develop by practicing, the more pleasure you get from the practicing of it, same as in an activity like swimming.

●

Emily Kneebone has a B.S. in botany from the University of Maryland. She is chair of the herbarium at Cylburn Wildflower Preserve and Garden Center in Baltimore and is second vice president of the Horticultural Society of Maryland. She is also an instructor in gardening and botanical subjects for the Bureau of Recreation of Baltimore. She notes that she is a member of the Camellia, Daffodil, and Cactus & Succulent societies of Maryland.



For people who are unfamiliar with keys or those who would like to practice, *Master Tree Finder* by May Theilgaard Watts is a good way to begin. It is a manual for the identification of trees by their leaves. It's 4 in. by 5½ in.—small enough to fit into a pocket. Copies are available in the shop on the first floor at PHS for $1.00.

For residents of Maryland, *Leaf Key to Common Trees in Maryland,* an 8½ x 11 pamphlet, is available at Extension Service offices.

A longer book with an equally simple key is *Trees, Shrubs, and Vines* by Arthur T. Viertel, about $6 plus postage and handling from Syracuse University Press. Good because it covers both native and cultivated ornamentals.

Tree keys are by far the easiest way to begin. For wildflowers try Peterson & McKenny, *Guide to Wildflowers,* where the key is based on color of flower; or *Newcomb's Wildflower Guide* by Lawrence Newcomb which has, to quote the cover, "an ingenious new key system for quick positive identification of wildflowers, flowering shrubs and vines." Illustrations by Gordon Morrison are excellent. About $7, Little, Brown. This book might be available in your library for a preliminary look before buying.

Having mastered any one of these keys, and having watched as Jennifer's key was constructed, you will be ready to plunge into Britton & Brown, or even Gray's *Manual* (Gray's is not illustrated).

For cultivated plants, woody or herbaceous, Bailey's *Cyclopedia* has a key which is based on flower and seed characteristics. Before trying that key, you should learn to read botanical descriptions and also to recognize the main plant families. E.K.

tracking ilysanthes

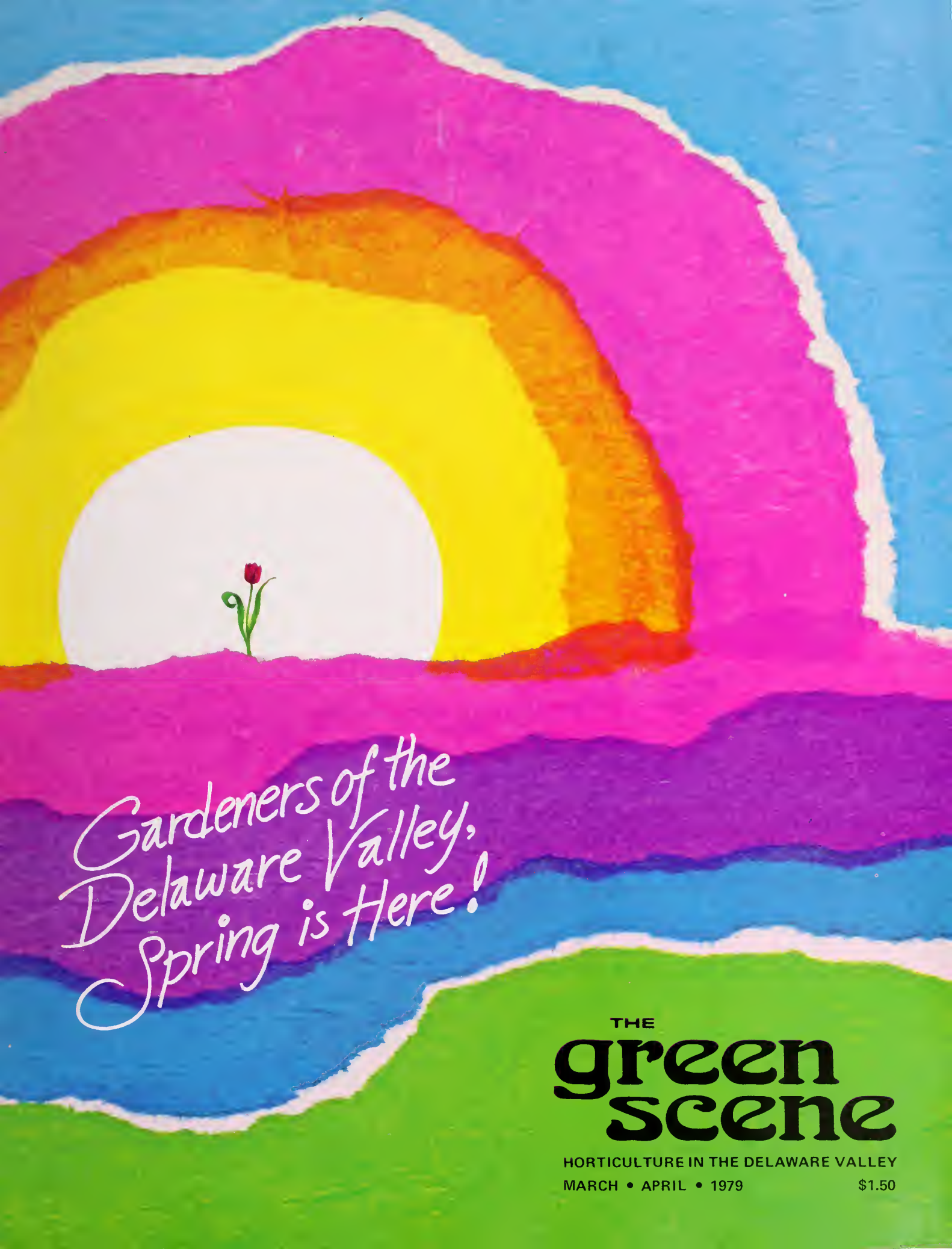
I can't resist telling the story of my latest plant mystery and its solution. I was recently visiting a friend and she showed me a hanging basket house plant that was blooming. She said she has never been able to find the botanical name for it. She had bought it several years before in New York and had been told the only name they knew was angel tears. She told me it reminded her of *Pilea depressa,* a house plant known as creeping Charlie, but I said it looked like the wild plant anagallis to me—the scarlet pimpernel—except for the flowers, which were blue, tubular, and irregular, not at all like anagallis. She gave me a stem with several flowers on it and I promised to see if I could key it out for her.

First I dissected a flower to discover whether it was in the Scrophulariaceae (figwort family) or the Labiatae (mint family). It was Scrophulariaceae. (I used a key to plant families on this.) Then it occurred to me to hunt around for the common name. *Hortus III* gives several species under angel's tears, none of which are in the Scrophulariaceae. I decided to look in *Britton & Brown's Illustrated Flora* at pictures of plants in the Scrophulariaceae, to see if I could find any clues, even though this was a house plant and B. & B. relates to wild plants of the Northeast. Since the figworts occupy 46 pages in B. & B., I was fortunate to find very quickly, in the first few pages, a picture that could almost have been a drawing of my unknown plant. I was intrigued that the name of the pictured plant was *Lindernia anagalliadea* since that specific name obviously relates to *Anagallis* which, as I mentioned, was what the plant reminded me of at first. The botanical description matched the plant almost as well as the picture. Not only that, but the common name for the genus *Lindernia* was given as false pimpernel. But the clincher was a synonym that was given for the genus *Lindernia,* namely, *Ilysanthes.* (I should explain that a single species can sometimes, for various reasons, have several different names. Every author endeavors to use what s/he considers to be the correct name and many authors also give other names that have been applied to that plant in the past. These are called synonyms.) The synonym *Ilysanthes* interested me because a couple of years ago in one of the big seed company catalogs* there was an offering of a hanging basket plant given the common name of angel tears and the botanical name of *Ilysanthes grandiflora.* I had never been able to find the generic name *Ilysanthes* in any horticultural book and it had not occurred to me to look in a native plant book.

To make a long story short, I provided my friend with a botanical name for her plant the very next day, and I found it by a combination of using keys and catalogs, playing detective, and, in general, just swimming around with it. Why didn't I accept *Lindernia anagallidea* as the name of the plant? Because that is a native wild plant and because I remembered the offering in the seed catalog and had made a note of the botanical name at the time. For my gardener friend's purposes, *Ilysanthes grandiflora* is a valid name. I as a botanist won't be absolutely positive of my identification until I have a chance to look at lindernia specimens in an herbarium some place such as the Smithsonian or the New York Botanical Garden, or until someone who knows tells me more about this plant. E.K.

*Park's Seed Co.

Artemisia versicolor: a low mound of lacy, filigreed leaves.
See story on page 13.



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HORTICULTURE IN THE DELAWARE VALLEY

Volume 7, Number 4 March/April 1979

published by
THE PENNSYLVANIA
HORTICULTURAL SOCIETY
325 Walnut Street, Philadelphia, Pa. 19106

THE GREEN SCENE, (USPS 955580) Volume 7, No. 4, published bimonthly, January, March, May, July, September, November, by the Pennsylvania Horticultural Society, a non-profit membership organization at 325 Walnut Street, Philadelphia, PA 19106. Subscription: $7.50 — Single Copy: $1.50. Second class postage paid at Philadelphia, PA 19104.

POSTMASTER: Send Form No. 3579 to THE GREEN SCENE, 325 Walnut Street, Philadelphia, Pa. 19106.

in this issue

A SPORTING PROPOSITION

by Bebe Miles

photos by author

Sport of *Tulipa fosterana* 'Dance' has eight petals.

Double bloodroot *(Sanguinaria canadensis multiplex)* deserves the adjective "exquisite."

Many years ago I found a black-eyed Susan with petals streaked mahogany and orange. I picked my find and gave it very proudly to my mother. Years later I saw the gloriosa daisies originated by W. Atlee Burpee Co. and realized that Nature had anticipated their advent by at least a quarter of a century. Burpee says theirs are tetraploids developed by careful breeding; mine was a natural mutation in a field, but I blew it.

What I should have done, of course, was to protect the plant until the flower had produced seeds, then collect and sow them and see what I got in the second or even third generation. Since I was hardly 10 at the time, perhaps I can be excused for overlooking the opportunity.

Many a current star of our gardens is the result of more experienced gardeners' noticing and saving for propagation an aberrant form of flower, fruit, or leaf or other characteristic. The popular Delicious apple is just one of the more publicized such successful endeavors.

Double flowers come immediately to mind as being sports that deserve special attention. Often they make more of a display than singles. Many times they are sterile and thus last longer in bloom. Look through any garden catalog, and you'll find a plethora of doubles in genera as far apart as tulips, lilacs and painted daisies. Chances are most of them originated as natural sports, and many have had a long career. Murillo (a double early tulip) dates back to 1860. Oddly, a large percentage of the other early double tulips now offered appeared first as sports within plantings of this one tulip. It would seem almost as if some individual plants contain a proclivity to mutate within their makeup.

Native American plants have not been subject to cultivation as long as those of Europe and Asia, but there are some notable double sports in commerce. Semi-double forms of our bloodroot *(Sanguinaria canadensis)* were dis-

continued

A SPORTING PROPOSITION continued

Phlox stolonifera 'Blue Ridge' exhibits its vivid color amidst a drift of crab apple petals.

Tiarella wherryi has deeply-indented foliage and does not creep like the ordinary foam flower.

covered before 1732, and the true double has been delighting gardeners a long time.

Improved color, size, perfume or other flowering habit can be equally important. Philadelphia's own Mrs. J. Norman Henry discovered the creeping *Phlox stolonifera* 'Blue Ridge,' a standout in any garden.

Burpee says theirs are tetraploids developed by careful breeding; mine was a natural mutation in a field, but I blew it.

Leaf color, size and shape are other things to look for. *Tiarella wherryi* (named for Edgar T. Wherry, one of the founders of Bowman's Hill State Wildflower Preserve) is a non-creeping form of foam flower with deeply lobed foliage that is itself distinctive. Variegated foliage too is always worth a second glance. Fall leaf color varies greatly from individual tree to tree. I have a sweetgum, for example, which produces one brilliant red branch long ahead of the rest of the tree and in great contrast to the other shades of the same tree. If it does it again this fall, I shall mark the branch and attempt to propagate it vegetatively, for a cultivar that produced a whole tree like that would be a real find.

Dwarfism or its opposite might make a particular plant worth more than the normal type. Just think of the hundreds of dwarf Alberta spruces in our suburbs alone. Creeping forms, weeping clones and columnar growth habits are especially sought after among trees and bushes.

Fruits with better color or size, whether edible or not, are another place for sporting. Yellow-berried American dogwood and holly are famous sports; their desirability as ornamentals is as important to the landscaper as the apple to the farmer.

Not all sports are either beautiful or beneficial. One section of my raspberry bed produces some double-headed fruit each year. We have had double strawberries too. They are all hard to pick.

Even more disappointing was the strain of white marigolds I developed in answer to Burpee's long quest for that flower. Over several years mine consistently bloomed with double heads. Despite their whiteness, they were as ugly as can be and reason enough to abandon my program. Equally worthless in my estimation are the eight-petalled tulips which some of the newer hybrids produce from time to time. They lack the grace of the normal six petals for me.

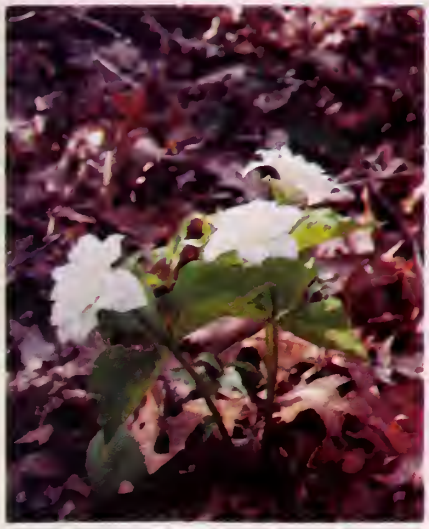
Now, what does all this have to do with you, the amateur gardener?

It ought to add a fillip to your yearly garden chores, for you might discover a valuable sport yourself. No one can predict when or where another mutation will arise.

Anyone who raises plants from seed, however, is more likely to run across a mutation, because no one can know beforehand what deviations from the norm lie coded in the chromosomes of the seed.

Those gardeners who specialize in

Picea glauca 'Conica,' the dwarf Alberta spruce, seldom tops 10 ft. even after decades of growing.



Double sport of *Trillium grandiflorum* resembles gardenia.

Virginia bluebells *(Mertensia virginica)* has forms with both pure white and all pink flowers.

American plants are even more prone to find abnormalities. The gene pools of most of our natives have hardly been stirred as yet. This is in direct contrast to that of many of the more traditional perennials. Extensive selection (as well as hybridization) has given us great named chrysanthemums, dahlias, iris and daffodils, to name only a few. But such work reduces the diversification available because much of it is done with the same small group of plants. The gene pool gets smaller that way.

loading in your favor

You can even load things more in your favor. Consider what might be possible with such a species as our eastern columbine *(Aquilegia canadensis)*, which is found in the wild from Quebec and Ontario to Wisconsin and south to Florida and Texas. Or the common Virginia bluebell *(Mertensia virginica)*, which occurs naturally from Ontario to Minnesota and south to Virginia, Alabama, Arkansas and Kansas. Over the milleniums the gene pools of such species must have come to harbor tremendous variations. Someone who raised plants of the same species from seed collected both in Maine and in the southern Appalachians and then let them pollinate each other could reasonably expect at least a few individuals to show some interesting deviations from the type.

Would the mutations (or possibly hybrids) be any improvement over two such very lovely natives? Who knows? I have great sheets of the columbine in my garden where it seeds itself prolifically. I cannot point to much difference in color, but there is definitely a difference in bloom time. Some plants are very early, others so late that their pollen is taken by bees to stands of the later-flowering yellow *A. longissima* of Texas and the blue and white *A. caerulea* of Colorado. As a result natural hybrids of all sorts arise in the latter two colonies, not wholly a desirable effect but interesting.

At Bowman's Hill natural stands of the mertensia have increased prodigiously from plants originally collected mostly in Bucks County itself. Even with such a limited gene pool there are pure white, pure pink, grayish lavender and myriad shades of blue mertensias there.

Or consider *Trillium grandiflorum*, a wonderful white spring woodland flower found wild from Quebec to Minnesota and south to Florida and Missouri. Bailey in *Hortus II* mentions its proclivity to sport. Pure pink forms are known as well as gorgeous doubles that resemble a gardenia, but they are rare treasures.

continued

A SPORTING PROPOSITION continued

White liatris with noticeable branching habit.

One can only speculate on what might arise from a bed of geographically mixed seed after a few generations.

You must sharpen your wits to gain the most from any such adventure. Sometimes a plant will be so different from its fellows that even a cursory glance will notice it. Other times it takes careful checking. I have a strain of white liatris raised originally from seed bought from Parks simply as Liatris, Pure White. Its progeny over several generations have been all white, but I have plants that bloom in early or late summer. Some are very tall, a few quite short. Some yield thin wands of flowers closely set along the central stem; others are generously branched so that a single stem resembles a small tree. Whether these are true sports or some hybrids is unimportant to me. I have some dazzling plants, that I do know.

In any such project albinos are always an interesting possibility. Most of those we already know were found by an acute observer, and they are the product of nature rather than any person's work. (The hybridizer, however, may use them for further work.) Some go directly into commerce as named clones such as Dicentra Sweetheart, a white form of *D. formosa* from the Pacific coast. The white eastern form has no commercial name I know of.

The seed of white forms may not always produce white offspring. I have a white strain of *Lobelia siphilitica*. Its seedlings may be either white or the more normal blue, but one of my plants has blue and white striped flowers. I am watching that one carefully.

what to do with a sport

That brings us to the most important part of all: what to do with your sport (or natural hybrid) after you find it? Obviously you don't pick it for any reason. The first order of business is to mark it some way. Then photograph it in color closeup so you need not rely on memory. Write down a good description too on the spot.

You might want to protect the plant by a wire basket from untoward misadventure. Gather the seed when it ripens (if it does), label and sow it to see what it produces.

In commerce most famous sports are vegetatively reproduced. (Cloning is making headlines nowadays, but the nurseryman has been doing it for years.) This guarantees that each new plant will be an exact duplicate of the original. Each type of plant may require a different technique.

Phlox, for example, will strike roots easily in spring if a growing stem tip is merely inserted into the soil and kept reasonably moist and shaded for a few weeks. The double bloodroot, on the other hand, is best handled when going dormant. Dig carefully around the plant and cut off a piece of root with an obvious bud; all things being equal the piece will start a new colony of this treasure.

Lobelia stools out from the mother plant (i.e., forms additional rosettes from mother plant). If my striped plant looks good again this summer, I will separate some of these offsets from the mother and plant them individually in a colony by themselves. The offsets should be exactly like the original, but the interesting part will be to see whether the resulting seedlings a few years hence will resemble the parent. Possibly they will break into some blues, some whites and some striped, and I will know I have a hybrid rather than a true sport. (Mendel's Law strikes again.)

Other plants can be reproduced vegetatively in various ways; use the one best suited for the genus in question.

Meanwhile you might do a bit of research to see if anyone else has reported a mutation similar to yours. One sure way is to find the same general description in a nursery catalog.

You could call in a botanist or a nurseryman to see if they find your sport worth propagating. You could keep it all a secret and just treasure it for your own enjoyment. But if your find is really an improvement for one reason or another, sharing is more in the gardening tradition. This also guarantees its continued existence. Should catastrophe strike your garden, a stand somewhere else will mean your sport is not lost entirely. Nature does not produce her variations every day, and it is a shame not to make the best use of what she does bestow.

●

The latest book by Bebe Miles, *Wildflower Perennials for Your Garden,* was recently the selection of the American Garden Guild Book Club and has just been issued by Hawthorn.

Hart's Tongue Fern

by Alexander L. Crosby

When my wife and I visited Ireland in 1962, we found the hart's tongue fern *(Phyllitis scolopendrium)* growing as abundantly as ragweed along a roadside ditch near Dublin. We gathered more than 100 fronds for use on our Christmas cards, packing them in old magazines for the flight home.

The fern occurs naturally in the United States only near Syracuse and in Tennessee; we had never seen it before. Could we start a colony in our Pennsylvania woods? First, we needed plants. The backs of our pressed specimens were loaded with fruit dots. We mixed peat moss, sand, and topsoil in a plastic box, brushed the mixture with a fertile frond, watered liberally, put the lid on, and waited.

Within three weeks the soil was green with prothalia. Soon the first leaves appeared. In a couple of months we had plants large enough to move to small pots.

Choosing rich soil by a small stream, we planted several ferns in the early spring. More went into our rock garden, and others were given to friends. But the only ones that survived the first winter outdoors were a pair in the rock garden, which had been well watered during the summer. A hart's tongue fern does not know how to say No to a drink.

The friends who planted outdoors were all bereaved. It seemed to me that a fern that could withstand the winters of upstate New York should find Pennsylvania tolerable, but perhaps the Irish breed is gentler in Dublin than in Ulster.

Where the ferns flourished was in the house. Since I had been growing ferns from boyhood, I expected some success, and I got it. But my largest plant began to show browning leaves a year ago. "It needs repotting," said Nancy, who had no experience in fern culture.

I repotted, after slicing the plant in half with a carving knife. I wish I had measured and recorded the soil mixture. It was probably equal parts of peat moss, compost, and black dirt from a lake bottom in the Poconos (I once invested $60 in a truckload).

One plant is now flourishing in the bathroom and the other fills a living room windowsill with fronds up to 23½ in. long. In *A Field Guide to the Ferns,* Boughton Cobb gives the hart's tongue leaf length as 12 in., more or less. Specimens in the wild don't get their fill of well water three times a week, without any competition from other plants.

Our two plants represent the third generation of hart's tongue ferns in Quakertown. By the time you read this, a fourth generation will be half an inch high. Only 23 more inches to go.

●

Alexander L. Crosby is an occasional contributor to *The Green Scene*. We first encountered his work in *The New York Times* where he was exhorting gardeners to do unseemly things like pirate certain plants (with strong conservationist instincts, of course). A modest man, we had to find out for ourselves that he was considered one of the top writers in the important Federal Writers' Project for the WPA during the 1930's.

photo by author

Hart's tongue fern *(Phyllitis scolopendrium)*

photos by Edmund B. Gilchrist, Jr.

Peonies and dogwood *(Cornus kousa)*. The peonies were cut at the bud stage, wrapped in damp newspaper and stored for three weeks in the refrigerator. The arrangements were photographed two days after they were taken from the refrigerator still at the bud stage.

Holding Back Flowers for Special Occasions

by Helen A. Jones

Forcing is a well known technique for bringing flowers to early bloom; here's a way to hold back bloom until it's needed

At one end of our small cutting garden stand several clumps of old-fashioned peonies, most of them pale pink and white. They are special to us because they were planted in the original garden of our house that we bought 26 years ago. At that time we divided the peonies and put them in the cutting garden. Every June we look forward to their lovely bloom, which tells us that summer is just around the corner.

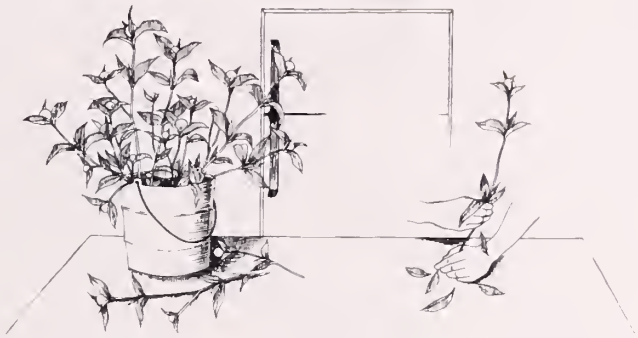
My husband travels a great deal, and I always hope we won't be away at this time, because before you know it they come and go, and we have nothing to remember them by but the green foliage at the end of the garden.

Summer a year ago, we were invited to a Garden Club of America Board of Associates' meeting in Wilmington, Delaware. The first evening we visited Mr. and Mrs. Pierre du Pont's beautiful house and garden, and the house was filled to overflowing with glorious peonies arranged to perfection. We had never seen such a sight, but what surprised us most was that it was long after the time for peonies to bloom. We stayed on after most of the guests had departed and asked her how they had accomplished this horticultural miracle. Jane du Pont did not hesitate to share her secret with us. She told us that their peonies came from large beds on their property, Bois des Fosses. In order to preserve them, the peonies are cut when the buds first show color and are then placed in a refrigerated room with a temperature of 45°. She keeps them there until she has an occasion to decorate her house.

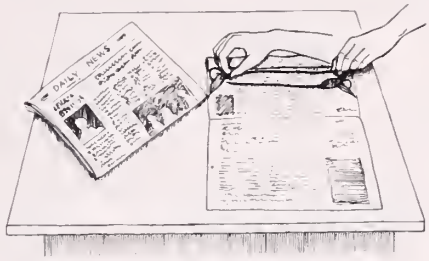
Last spring I decided to give it a try. Not having a cold room, I decided on another plan, and I must confess, I had my doubts as to whether it would work. We, too, cut our peonies in bud when they showed color and appeared ready to burst into bloom. I spread two or three layers of damp newspaper on the kitchen table and was ready to proceed. I stripped the leaves from the long stems, except for the top two brackets. I remembered that I always do this when I arrange them in a container. The next step was to lay one peony stem on the paper, roll it, and place another stem in the opposite direction, and continue this until I had a tight roll of a dozen and a half peony buds. I tried to be careful of the leaves and

continued

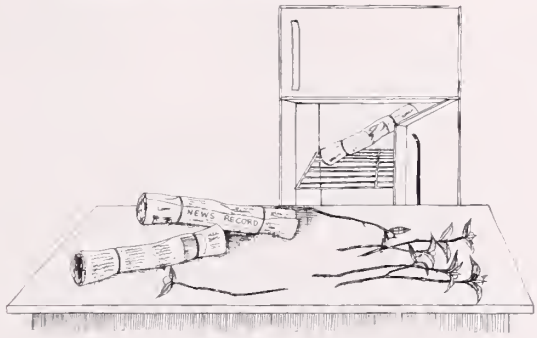
To hold back growth until needed:



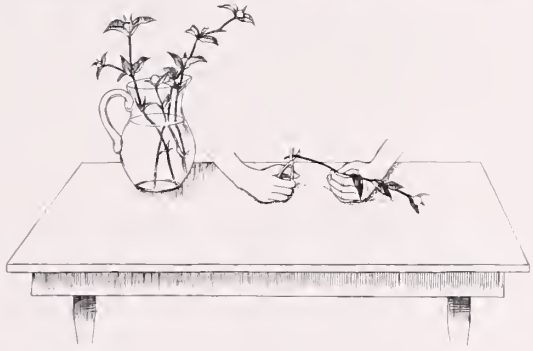
Strip leaves from long stems except for the top two brackets.



Lay one peony stem on three layers of damp newspaper, roll it, and place another stem in the opposite direction. Continue until you have a tight roll of a dozen and a half peony buds.



Secure roll with a rubber band on each end. Place in refrigerator until needed.



When needed for an arrangement: take the buds from the refrigerator the night before. Cut an inch off each stem with a sharp knife and submerge them in a bucket of lukewarm water (110°).

art by Suzanne Hughes

Holding Back Flowers continued

folded them pointed up toward the bud. I secured the roll with an elastic band on each end. My experiment was completed when I had three rolls of paper containing 45 peonies. (See illus.)

My husband asked me what I planned to do next. I removed a shelf from our refrigerator and placed the rolls diagonally in the back in order not to take up too much room. As you can imagine, I took a great deal of ribbing from all members of the family as they wanted to know what I was up to now. (The milk and juice were playing second fiddle.)

At the end of three weeks we were having a party. I had almost forgotten the experiment. Our garden is a shady one, and now that the trees were in leaf, I did not have much plant material in bloom except for a few roses and our *Cornus kousa* dogwood. Before I went to bed I unwrapped the peonies and was terribly discouraged. They looked hopeless. The leaves were squashed and appeared dead. I was sure I had wasted my efforts. The newspaper had dried out of course, and I wondered whether I should have enclosed the bundle in plastic. I decided to give it a try anyway, as nothing would be lost. I cut an inch off each stem with a sharp knife, and submerged them in buckets of lukewarm water (110°). In the morning to my utter amazement and pleasure, there were three buckets of beautiful peonies. Some almost in full bloom, and the others only half open. What pleased me most was the foliage. It had come alive and looked perfect.

I set to work arranging the peonies for our party. I put one container in our living room, and mixed peonies and *Cornus kousa* dogwood for the front hall. Unfortunately, when the pictures were taken the following day, the peonies were all full blown and the arrangements were not as attractive as they had been at the time of our dinner.

Since our successful attempt, I have talked to friends who have stored flowers this way. Mrs. Nicholas du Pont, a member of the Wilmington Garden Club, has great success with iris. She also picks them in bud and puts them in an old ice box in buckets of water. She says they keep that way for weeks. If you look back in the July 1978 *Green Scene* you will find J. Liddon Pennock, Jr., also stores nasturtiums from his greenhouse during the winter months. Others put their flowers in florists' boxes in the refrigerator with newspaper between each layer of buds. My "fridge" unfortunately is not large enough for this method.

I suppose the moral of our story is that in order to enjoy flowers during the long hard winter, we should take a leaf out of the florists' book. Now we can look forward to next spring when our cutting gardens come into bloom, knowing that we can enjoy peonies and iris long after our neighbors' flowers have disappeared. Try this with other flowers, and share your success with us.

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Helen Jones is an amateur gardener interested in many phases of horticulture. She is an active member of the Wissahickon Garden Club and is at present a vice president of the Garden Club of America. She is a lecturer and judge in flower arranging.

A PENTHOUSE GARDEN

by Emily D. Crouter

Can a compulsive gardener be happy gardening on a penthouse terrace? That was the question I asked myself three years ago when we sold the old Victorian house in which we had lived for many years. The garden there was gradually taking the upper hand and moving to an apartment was to have been temporary while we looked for a smaller house and a less demanding garden. Now the pluses seem to outweigh the minuses and we are still here, and I am still gardening by the old familiar trial and error method.

We brought with us an assorted collection of terra cotta pots, an English lead figure, a pair of wall brackets for ivy and a great deal of optimism. Upon surveying this good-sized terrace we realized that nothing could be watered thoroughly without drenching our neighbors below. With this in mind we had some large metal trays made, one long curving one to place against the iron fence and one much larger and in three sections that fits into a rather shady corner. Only then could we start working. Bags and bags of pebbles to fill the trays and bags and bags of potting soil were laboriously hauled up on the elevator and soon the trays were filled with pebbles and the pots were filled with soil. Since we had decided that pansies wouldn't last, we sat down to wait for mid-May and the bedding annuals. In due time we had geraniums, petunias, marigolds and impatiens. Nothing very spectacular but at least a start. In the center of the long tray and in full sun we put a favorite antique,

continued

photos by Edmund B. Gilchrist, Jr.

The author tends container plants in her penthouse garden.

Left: Petunia 'Summer Sun,' Marigold 'Lemon Drop,' and wax begonias in a strawberry jar. Center: *Salvia farinacea* 'Blue Bedder,' Streptocarpus 'Wiesmoor,' Nicotiana 'Lime Sherbet,' maidenhair fern, *Asparagus densiflorus* 'Sprengeri.' Figurine holds ivy. Right: Impatiens in variety, and Nicotiana 'Lime Sherbet.'

Left: Petunia 'White Cascade.' Center: Geraniums *(Pelargonium peltatum),* Petunia 'Summer Sun' and Marigold 'Lemon Drop.' Right: Petunia 'White Cascade.'

Tall tree: Bamboo *(Sasa sp.)*. Tall spiky plant to the left in foreground: *Asparagus densiflorus* 'Sprengeri' and other varieties of ferns.

an old white ironstone footbath which, I regret to say, didn't receive the treatment it deserved. For two years I ignored the fact that it had no drainage and gaily planted it, first with lantana (and white fly), and the second year with nasturtiums and sweet alyssym. Both plantings were soggy failures and by the third year I had learned my lesson. With a layer of large pebbles on the bottom we put several pots of white geraniums in it and tucked smaller pots of ivy in the corners. It really doesn't look as funereal as it sounds and everything has flourished. There are salmon geraniums in old black iron urns nearby and pots of Petunia 'Summer Sun' and little yellow marigolds. White petunias in two really large terra cotta pots with saucers flank this tray and thrive in the sunshine.

The corner plantings are more of a problem because they do not get much sun. At the back stands Junior, our little English lead figure who started life as a birdbath. Now, robins forgotten, he patiently supports a pot of ivy. Coral and white impatiens, Nicotiana 'Lime Sherbet' and other annuals are here. We use a liquid fertilizer almost daily and cut back in early August. When in the fall they seem too tired we'll replace them with chrysanthemums. We tried tuberous begonias in this shady corner

As for the parsley, after six weeks we have five whiskers. . . . As a hedge against inflation I don't recommend growing parsley.

one year but they did not do well. Wax begonias in a big strawberry jar are moderately successful as long as we can remember to turn the jar around fairly often.

After a good many failures we were happy with what we consider a small triumph. Two years ago, to make an instant effect for a party, I bought two pots of lilies from a local florist; I believe they were mid-century hybrids. After they bloomed they were hidden away and eventually buried in larger pots for the winter. What could we lose? We were rewarded the following year by plants at least twice as large and the year after with the same treatment each clump had 18 or 20 stalks and dozens of golden flowers. Moved out of their stylish containers, rather like Cinderella after the ball, we hope that they will bloom again next year.

By the third year we decided that it was time for a kitchen garden or at least a mini-one. I bought two magnificent brass-bound redwood tubs and planted a Rutgers tomato in each one surrounded by a planting of parsley seed. Alas, my vision of great, fat tomatoes growing along the fence, each tub wreathed in a lacy froth of parsley, has not quite materialized. Belatedly I

continued

'Rutgers' tomatoes

realized that just as annuals need frequent fertilizing so do tomatoes. One expert advised a solution of milk of magnesia and water! The first tomatoes were red, beautiful and delicious and about the size of golf balls. We hope that the next crop will be larger. As for the parsley, after six weeks we have five whiskers, the sturdiest about half an inch high. Now I understand why parsley is 79¢ a bunch at the market. As a hedge against inflation I don't recommend growing parsley.

Just as rain batters other gardens so it does ours, but our real enemy is wind. After two large glass table tops were lifted from their bases and hurled to floor, a shattering experience in more ways than one, we learned to tie them down with heavy cord when the weather threatens. We have also learned to keep a plastic watering can partially filled with water so it won't fly off to join a predecessor somewhere in outer space.

Insect pests have not been too much of a problem. The first year was the year of the white fly, and we sprayed. The second year was the year of the Japanese beetle when two of them scaled the heights. Although we marveled at their stamina they were short-lived. The third year was the year of the spider mites and again we sprayed but we have had no earthbound slugs or cut worms. This seems to me to be a pretty good record.

We have had a stroke of luck this year in having a good friend who has loaned us his exotic collection of greenery while he is traveling abroad. It's a mutually satisfying arrangement because we have feathery bamboo and unusual ferns to soften a rather dull corner where a partition screens the seamy end of the terrace.

I am also very fortunate to have a most capable young assistant, Christopher Hyk, who has helped me for eight years in the old garden as well as here. He not only is possessed of muscles for moving pots around but has great understanding. Knowing my love for the daffodils, which I planted years ago under our old beech trees, he brings me lovely ones from his garden. Daffodils in April, roses in mid-summer and holly and evergreens at Christmas.

Now high above the seasons we watch them change. After the willows and fuzzy spring green there are golden splashes of forsythia and puffy white magnolia and in summer the dark of copper beeches dot a bright green. In autumn the color is sensational and lasts for weeks, all those leaves that we won't have to rake. We're equally philosophical in winter because it's much easier to admire a snow storm from the nineteenth floor than from the upper end of a snow shovel. Of course we miss the bird tracks in the snow and the great cock pheasant strutting across the back lawn, but we do not miss the raccoons in the garbage pail.

Frost comes slowly to this upper level and one year we picked white petunias as late as December first. Possibly the chrysanthemums may live over so they are tucked away in a protected spot and will be watered occasionally during the winter. The other pots are emptied and stacked upside down in a sheltered corner. Now, full of plans for next year we eagerly wait for the new seed catalogs with their bright illusions of summer. Although I can never again hope to inherit the muddy boots of Gertrude Jekyll, I can still retain that trademark of all gardeners, dirty fingernails.

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Emily D. Crouter was the 2000th PHS member. She says it was so long ago she remembers wearing a hat with flowers on it. She helped establish the Wheel Chair Garden at All Saints Hospital in Chestnut Hill.

A CITY GARDENER GROWS COTTON, TOBACCO AND A FEW OTHER OFFBEAT ITEMS

by Wanda R. Larrier

photos by author

Flowering tobacco, *Nicotiana alata*

Turks Turban, *Clerodendrum indicum*

City gardeners that manage to grow anything at all deserve a salute. And if a garden reminds you of the Hanging Gardens of Babylon, you know that gardener is special.

Hazel Felton is a special gardener at the 56th & Haverford Urban Gardening Demonstration Garden. Since she gained her experience growing flowers, she feels she is a novice vegetable grower. So she uses her definite ideas about soil and plant requirements and hopes for the best.

Since the soil in empty lots is just bricks with clay or ash on top, soil amendments are needed to help the plants grow. There are many to choose from but Ms. Felton prefers cow manure and leaf mold. She feels the plants like the richness of the leaf mold, and vegetables fertilized with cow manure are sweeter. This summer she added top soil to raise the soil level and provide drainage. Slower growing long season vegetables also get a side dressing with an organic base fertilizer 10-6-4. This provides the constant slow release of nutrients the plants need.

This summer tucked among the regular vegetables and flowers were a few interesting items. Some of these were kohlrabi, turks turban and bottle gourds, cotton and tobacco.

These were all planted as mid-season warm weather crops around the first of May. Disregarding package directions because they don't always work on urban soil she planted by what depth worked for the seed size before.

The gourds and cotton were planted at a depth of 1½ in. The kohlrabi, both early white and purple Vienna, was planted at a ½ in. depth. The tobacco seeds are "finer than mustard seeds" and so were broadcast in the row and covered with soil and lightly patted in.

The gourds are treated as you would any squash. The kohlrabi is grown like a mid-season cabbage and thinned when it has three to four leaves. The tobacco seedlings needed the most care. After seeding, the row must be covered with light canvas, which is left on until the seedlings have three leaves. Tobacco should also be side-dressed at least twice during the growing season. Flower heads should be pinched to allow the leaves to fully develop. The only problem Ms. Felton had with these plants was aphids and flea beetles on the tobacco. A dusting with rotenone took care of them.

continued

The cotton was planted in semishade the same as tobacco but treated much the same as okra or eggplants. You don't need to side dress but thinning out to 6 in. or 8 in. apart helps. Though the cotton was flowering in August, it wasn't until early November that the bolls started to swell. By mid- to late November there might be some cotton ready to pick, but since it was raised for experience cotton isn't necessary but appreciated.

The tobacco was cured and given to pipe smoking friends; the gourds were used as planters and the kohlrabi was prepared in many delicious ways. If you are planning to grow these, here is a description of how Ms. Felton prepared hers.

curing tobacco

The leaves are ready when 4 to 5 in. wide and 8 in. long and have turned yellow. To pick, push the leaf down until you hear the stem crack then pull it up until the bottom also cracks and separates from the plant. Lay it flat or hang it stem up to dry. To make cigars roll the tobacco up before it's completely dry. For pipe tobacco let it dry and place it in a bag and crumble it by hand. The plant is also good to place in a compost pile after it is stripped.

gourds

Drying gourds for planters requires a different procedure than the usual way. You must cut off the top and scoop out the seeds and pulp the way you do a pumpkin. As the insides rot keep washing out the fungus with warm water. Be careful not to poke a hole in the side. When all the inside has rotted away let the gourds dry until cement hard, then varnish.

kohlrabi recipes

The young kohlrabi, 2 in. to 3 in. in diameter, can be eaten raw in salads, marinated or pickled. The leaves can be prepared like turnip or collard greens. They are good prepared as you would grape leaves. Take your favorite hamburger or meatloaf recipe, place a spoonful on the wide end of the leaf, fold the sides and roll the leaf up (like an egg roll). Simmer in a pan partly filled with liquid, about one cup, until tender. If you grow too much and the kohlrabi gets too big and woody, you can peel it and scoop out the center and stuff it. Replace the insides with your favorite meatloaf recipe again, then bake or poach as you did the leaves until tender. Kohlrabi is great substituted for turnips; try it.

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Luffa, *Luffa cylindrica*

Kohlrabi, *Brassica oleacea*

Wanda Rochelle Larrier is an extension garden assistant with the Pennsylvania State University Cooperative Extension Service.

Hazel Felton's peanuts and sugar cane were featured in last year's "Growing Interests" columns.

FOREST EDIBLES

by Jill Jacoby

As a veteran hiker and backpacker for over seven years, both here in the east and in the southwest, I have often found enough wild food to keep me alive for several days. Although I have never been in need of an emergency food source, it is a comfort to know exactly what is edible.

In addition to an emergency source of food, hunting for wild edibles has become an enjoyable hobby as well. It is interesting to note that many plants we consider to be weeds are actually quite edible and nutritious. Furthermore, several plants that we recognize as edible (such as some fruits) also have other edible plant parts (stems and leaves).

Knowing the edible plants in one's neighborhood can eventually lead one into the forests for a wider variety. (While working in my home garden, I will amaze my neighbors by bending over and munching on a piece of purslane, *Portulaca oleracea,* a well-known weed!)

Many plants are easy to identify and fun to hunt for and can be found in Pennsylvania and surrounding states. Several of these plants have medicinal qualities, which leads us to other aspects of this hobby, that is, knowing the vitamin content of the plants and which illnesses they may cure.

Many American Indians still use sacred herbs and plants for medicine that they get from the forest floor. They grow in abundance and probably some grow very close to where we live. Plants such as *Arisaema atrorubens* (Jack-in-the-pulpit) can be used to make flour, although more often they are added to flour. Because every part of the plant will burn the mouth if eaten raw, the roots must be roasted to rid them of their corrosive acridness.

Large plant in middle is poke of the Phypolaccaceae family – edible only when 10"-12" high.

Sassafras *(Sassafras albidum)*

It is the only method to make them edible. The plant is now protected in some states, and harvesting and picking are restricted. There is a satisfying feeling about the thought of protecting it. Anyone who comes in contact with the Jack-in-the-pulpit knows its unusual beauty. It has one or two long stalked, three-parted leaves that are quite shiny. The spathe or pulpit is green with purple and whitish stripes running vertically. Inside is the spadix, representing the Jack. This picturesque plant is easy to recognize.

Clover (white), *Trifolium repens,* or (red) *Trifolium pratense,* is another plant that some Indians still eat and use with versatility. The entire plant, leaves and flowers, may be eaten raw or cooked (boiled). The root can be dried and smoked much like tobacco. Finally, a medicinally valuable tea can be made from the mature blossoms. This tea is said to relieve congestion caused by colds and was used by herbalists of early times. The flowers should be picked on a dry sunny day and dried at room temperature. One teaspoon of the dried flowers to a cup of boiling water will create a special drink. The best way to get an idea of this drink is to eat the clover raw, then make the drink and experience the sweet, but at the same time pungent aroma and flavor.

proceed with caution

Of course, all parts of a plant are not always edible. An excellent example of the need for selectivity is *Podophyllum peltatum,* the May apple. The fruit is the only edible part of the plant, the rest of the plant is poisonous and will cause sickness or death. The Chinese used the root as a powerful narcotic in herbal healing, but it is extremely dangerous. The Lenni-Lenape Indians used

continued

FOREST EDIBLES continued

May apple *(Podophyllum peltatum)*

Jack in the pulpit *(Arisaema triphyllum)* — roots used in making flour

Sweet fern *(Myrica spp.)* — excellent tea plant

the dried root of May apple as a suicide plant. The fruit is only edible in late August or early September when it is soft and full and very yellow. The May apple, as the name implies, blooms in May and has a truly exotic flower. The leaves, composed of five to nine lobes, seem to form a large umbrella. From the middle of the crotched stem emerges a showy, white, fragrant flower. Again, this is an easily identified plant. It is evident that before using, knowledge of the plant is necessary and precautions taken.

There are other easy to identify plants, for example, berries; even so caution must be used. I have read in numerous survival books that when in a "life or death" situation, any black berry can be considered edible. **The poke berry *(Phytolacca americana)* is black when ripe and extremely poisonous,** which disproves that point.

Blueberries, the vaccinium genus (which contains numerous species) are

Blueberry *(Vaccinium sp.)* in flower — May

easy to recognize once you have seen them a few times. All of the berries in the blueberry genus are safe to eat. The berries are usually blue or black, but sometimes I've found them to be reddish. The bush flowers from May to June, and the fruits ripen in the late summer. Many times I have come across blueberry bushes laden with fruit. I'm always careful to take only what I need, because birds also enjoy the sweet blue fruits. Berries are not a fruit to depend upon for survival, unless you get lost between July and September when they are ripe.

Grape vines (*Vitis* spp.) can also be found growing in abundance, especially in Virginia. The problem with grapes (although not a very big one) is that grapes climb and most of the fruits are out of reach. The answer to this dilemma is that the leaves and young shoots in addition to the fruits are edible and rich in vitamins A, B and C. The roots, however, are poisonous, which again proves that you must know your plants. In a survival situation, it is good to know that dehydrated clusters of wild grapes (and many berries) are edible. You will, however, have competition from the birds who eat the fruits throughout the winter.

The Rosaceae family has an enormous group of plants in it. Several of these are edible, including rose hips, which are rich in vitamin C, and will cling to the bush all winter. There are many berries in the rose family including: serviceberry, raspberry, blackberry, also wild apples and plums. Another is the wild strawberry, which is edible in every way that cultivated strawberries are, but better tasting. They are rich in the scurvy-preventing malic and citric acids and are high in vitamin C content. The wild berries are considerably smaller compared to commercial berries, but about 80 times tastier. They usually grow in vast numbers, an entire field or pasture can be seen covered with tiny glowing red specks.

teas

Some of the most rewarding plants to be found are those the can be made into a tea, all with different flavors, vitamins and blooming times. Here are a few of my favorites: sweet fern *(Comptonia peregrina)*, from the Myricaceae family, is not really a true fern as its common name implies. It is the only aromatic wild plant among those with three bundle scars. Sweet fern blooms from April to June with its edible nut. The leaves can be used dry or fresh to make an excellent, fragrant tea.

A long time hiking buddy of mine, Rob Aptaker, has taught me a great deal about wild edibles. Together we have found wild mint growing in fields in great quantities. When looking for mint, a good identification tip, in addition to the smell, is to look at the stem. All plants in the Labiatae family have square stems, although all are not mint flavored. The plant blooms from June to August and seems to have its strongest flavor then. Boiled and steeped, it makes a tea rich in vitamins A and C. This plant may also be dried at room temperature for winter use.

Another good tea is *Sassafras albidum* from the Lauraceae family. Before describing it, one other important point must be made. With technology and population continually increasing, man continues to raid the forests for trees and herbs. Now, as people start to realize this, more and more people are reverting back to nature. National parks and hiking trails are used more frequently each year. With people gaining interest and increased knowledge of wild plants that are edible, another strain is put on wild plants. To get back to the sassafras—it does make a mighty fine tea, but it is the root of this plant that is used for tea. Thus the plant must be destroyed and the forest further depleted. Whenever possible, avoid eating such plants. If your curiosity cannot be satisfied by just observing, then find an area where the plant grows abundantly and take your specimen. Sassafras reproduces by runners so if there is only one plant in an area, you would stop reproduction of others by digging it up. On the other hand, thinning a densely populated area is beneficial for the remaining plants. The smaller plants will be the easiest to uproot, giving the larger, more mature plants more root space.

other uses

The green winter buds and the young leaves of sassafras will add flavor to a salad. The leaves are quite interesting, having three different shapes, all occurring on the same plant in an alternate pattern. One leaf is oval shaped with smooth edges. The next is round at the base and forms three lobes, the middle one being the largest. The third looks much like a mitten, with one lobe forming the thumb. Sassafras contains an oil

continued

Wild mint *(Mentha piperita)* — used for tea

that is said to have a narcotic effect when drunk in large quantities. No harmful effects have been observed when consumed in moderation. The berries are not edible.

There is a host of wild edible plants awaiting to be discovered. I have tasted each new plant I have found. Then I take a picture of it and jot down a few notes on the flavor, and where it was growing. If the plant must be destroyed, I taste it once and from then on, I take only photographs. That's one way I feel I can help the forest maintain its beauty.

There are a number of books on the market that identify the wild edibles and give a brief description about them. Here is where caution must be exercised. Most of the plants are sketches in ink or colored drawings. Rob and I came across wild lettuce in Virginia and by using the description in the book, we walked away confused. The picture showed the leaf as smooth; the plant which was in front of us had heavily serrated edges. In different geological boundaries, plants tend to change characteristics, especially in the mountains. We had snapped a picture of it and later were able to identify it as *Lactuca scariola* and *L. canadensis.* We didn't eat the lettuce because we were not sure of its identity. Always be 100% positive that the plant you are about to devour is the same one which is described in your field book. This point can't be stressed enough. If you are not sure, do not pick it.

A walk through the woods can be an invigorating experience. Take along a few good books on trees, birds and wildflowers, and you will be sure to learn and experience many new facets of nature. Bear in mind the old saying when you're outdoors: "Take nothing but pictures and leave nothing but footprints."

LIST OF ALL PLANTS MENTIONED

Amelanchier spp. - serviceberry
Arisaema triphyllum - Jack-in-the-pulpit
Fragaria vesca, F. virginiana and related species - strawberry
Lactuca canadensis and *L. scariola* - wild lettuce
Malus spp. - wild apple
Mentha piperita and species - wild mint
Myrica spp. - sweet fern
Phytolacca americana, poke berry
Podophyllum peltatum - May apple
Portulaca oleracea, purslane
Prunus spp. - wild plum
Rubus spp. - blackberry and raspberry
Sassafras albidum - sassafras
Trifolium pratense - red clover
Trifolium repens - white clover
Vaccinium spp. - blueberry
Vitis aestivalis, V. labrusca, V. rotundifolia - grape vine

REFERENCE BOOKS

The Herbalist by Joseph Meyer. Clarence Meyer, 1975.

This book I list not as a field guide, but as a source of medicinal plants found growing wild.

Field Guide to Edible Wild Plants by Bradford Angier. Stackpole Books, 1974.

This book has been the most useful for me. Excellent color pictures and descriptions.

Stalking the Wild Asparagus by Euell Gibbons. David McKay Company, Inc., 1962.

Gibbons book gives some interesting recipes but is not a good field guide. He relies on verbal descriptions and has only a few pencil sketches of the edibles.

The Wild Food Trail Guide by Alan Hall. Holt, Rinehart & Winston, 1976.

A good field guide with detailed sketches, plus a section in the back on poisonous plants.

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Jill Jacoby is in her junior year at Penn State University where she is majoring in agriculture education with an emphasis in horticulture. From April to June, 1978, she spent eight weeks in Utah and Arizona taking part in a Desert Field Study program with the University of California, Santa Cruz. She is a graduate of EMCO Vocational-Technical School's horticulture program where she was awarded the Kiwanis-Hatboro Student Award in Horticulture. The Trevose Horticulture Society awarded Jill the 1977 Student Award. Jill is also a familiar face at Morris Arboretum in Chestnut Hill where she has volunteered many hours of her time.

landscaping a swimming pool area

by Beverly M. Miller

A swimming pool should not preempt a carefully landscaped backyard. With the same skill and decisiveness used to plot a bountiful vegetable garden, you can plan for a swimming pool and surroundings comprising a vista aesthetically adaptable to the changing seasons.

Such a pool was the goal our family began to plan for in the winter of '77. We found that the time element, combined with horticultural know-how and the added expertise of a landscape designer, turned the project into a dream realized.

Each member of the family had different reasons for wanting a pool. But we all wanted to preserve the tranquil environs of our home. The children had a vested interest in an old apple tree, which they loved to climb and several old oak trees, used as an occasional campsite. My husband wanted to continue vegetable gardening, while I wanted to keep my cutting flower garden intact.

Our decision to actively pursue the project was also tempered by the reassuring information from the American Landscaping Association and Real Estate Association that the resale value of an attractively shrubbed home is increased by 20%. In addition, specimen plants become more valuable as they mature. Thus, we regarded the project from a monetary as well as an aesthetic point of view.

Combining pragmatism with beauty is not as difficult as it sounds. The trick is to consider the pool as a portion of a larger natural entity. Numerous woody materials and boulders, all

continued

photos by Herb Millstone

Tree on the berm on left Malus 'Red Jade.' Right-hand corner *Pinus strobus pendula.*

landscaping a swimming pool area continued

selected by shape, texture and color, all created a new atmosphere enveloping the main house.

The new vista, however, is not a one-way scene. The view is equally pleasant from the pool. The total tapestry obtains its effect through painstakingly woven threads—each tree, plant and boulder, collected and situated for a specific purpose.

planning

The collection is a personal triumph. At almost the same time pool plans evolved, I happened to spot several specimens at Millstone Nurseries in Warrington, Bucks County, owned by landscape designer Herbert Millstone. Like the coveter of a rare gem collection, I had to have them.

View from the pool. Plant in center of rocks, *Juniperus sargenti,* large center plant, *Pinus mugo;* lower right corner, *Rhododendron maximum.*

Front left *Pinus densiflora* 'Umbraculifera'; right corner *Pinus bungeana;* center around pole *Ilex crenata.*

View toward berm. Left *Pinus thunbergiana;* right *Pinus densiflora* 'Umbraculifera.' On railroad ties in front Artemesia 'Silver Mound.'

Although pool companies install a terrace, otherwise known as the walkway and sitting area around the pool, we decided from the outset that we would install our own—a brick paving set dry on a sand base.

One of the reasons for this decision was our determination to keep our existing grounds intact. I had firmly decided to cancel the project if it meant destroying any of our beautiful old trees. I had heard about, and was dead set against, the massive concrete-hauling trucks used by the pool companies to bring material to the terrace site.

Although we knew the kind of overview we wanted, the cry for professional help came once we realized the many facets involved. The logical choice was Millstone, who happened to be well-versed in pool landscape design. He informed us right away that the terrace materials would be transported to the site by wheelbarrow, which set my mind at ease, making it somewhat easier to accept the tractors, with their 14-ft. long and 6¾-ft. wide shovel scoops, which I knew the pool company would eventually be bringing in to dig the hole for the pool.

The type of construction equipment you are willing to allow on your property is an important decision, which must be considered well in advance.

But long before the pool representatives arrived to discuss just the pool specifics, the rest of the natural vista had already been planned, with Millstone's help. The best advice I can give is to contact the designer at the start before the pool contractor because landscaping details are more time-consuming than one would imagine.

soil distribution

Our particular swimming needs dictated the construction of a rectangular, 18-ft. wide by 40-ft. long pool. We learned that the average pool yields 25 truckloads of good soil, which will be taken away if some other use is not decided upon in advance. Therefore, we formulated plans for the earth well in advance of the excavation date.

The approximate amount of leftover soil was calculated and earmarked for a specific distribution pattern. We attempted to adhere to natural, flowing lines in working out the berms and hills surrounding the pool. Plans also called for the pool itself to be dug deeper than usual. Contrasting dimensions of depth and height helped to create interest and break up the scenery.

Planned gradations also insured a future naturalness around the man-made pool. Our final choice, with its standard diving board and special swimming lanes, was transformed by the berms, boulders and plant materials, to the point that it almost resembles a pond from a distance.

the terrace

The vista around the pool began with the brick terrace, installed for the purpose of achieving tranquil traffic flow

continued

in a natural setting. The brick walkway around the pool was restricted to 2 ft. rather than the standard 3 ft. to prevent interference with the natural overtones.

The larger brick sitting areas had to be specifically graded away from the pool in order to prevent an accumulation of rain water and surface debris from washing into the pool. A problem arose with the planned terrain blocking the needed surface draining. The solution was the use of underground drainage via a plastic perforated pipe. River gravel was used to camouflage the pipe.

surrounding landscape

Natural, earthy tones influenced the selection of woody plant materials, combined with contrasting textures provided by vertical boulders, horizontal railroad ties, gravel and round stones. Each texture directs the eye to the next, and the overall circular design scheme tends to slow the gaze.

Broadleaf and needle evergreens in different shades were used predominantly in the basic setting of the pool.

Much of the early landscape plans centered around the fact that a fence would have to be installed around the pool site. Township law dictates that pools be enclosed by fences as a safety precaution against trespassers.

Although we had to comply with the law, our goal remains to completely camouflage the fence.

To this end, we passed up many textures and colors in favor of a black vinyl chain link type, figuring the airiness of the webbing would blend in more naturally with the surrounding landscape. While the choice works fairly well, the structure's presence is still very apparent to us, and we won't be completely satisfied until the entire fence is obscured.

In the meantime, a shield is provided on one side by a 15-ft. *Pinus strobus;* a 10-ft. *Pinus bungeana,* with its lacy bark; a *Chamaecyparis nootkatensis* 'Pendula,' a towering true specimen; and a *Pinus densiflora* 'Umbraculifera,' Tanyosho, the Japanese umbrella pine.

Along the fence's perimeter are many deciduous plants, including a spectacular Malus 'Red Jade,' with its oriental habit topping one of the many berms; an *Oxydendrum arboreum;* the *Crataegus cordata* and the low-growing *Euonymus alata* 'Compacta.'

Other recommended poolside woody plants are the *Pinus strobus* 'Nana' and the *Pinus strobus* 'Pendula,' which mask a large propane tank used to filter the pool.

Continuing to gaze, one finds a spray of hemerocallis, the daylily, which exhibits its rich color from early spring to fall, requiring minimum care the rest of the year. These qualities also make hemerocallis a recommended pool garden entry. The vista also includes various plantings of *Rhododendrum maximum, Ilex crenata* 'Convexa' and *Yucca filamentosa.*

The specimens were transplanted once the pool was finally situated. Some of the specimens, raised by Millstone to growths weighing over a ton, had to be installed with great precision, so as not to disrupt the complicated root system (embedded in their protective mound of earth) when balled and burlaped.

In a word, preparation is the key to a thriving, new vista. Plan the location of the new specimens carefully, since roots can obviously overlap, restricting growth patterns, if the plant materials are not situated properly to begin with.

But more important, be prepared to constantly help the new specimens adapt to their new habitat. If the soil is healthy, the new plant materials should take well to the environment. But constant irrigation is the vital transition factor. This method far surpasses the benefits of rainwater, which cannot reach the roots of larger trees.

While irrigating the landscape was another important consideration in planning the pool, I realized too late the importance of having a water line right at the poolside, in addition to the electric and gas lines situated there.

Our grounds include an existing carriage house and larger terrace with water lines, from which massive hoses had to be stretched in order to reach the new pool landscape. While dragging the heavy hoses was a bother, the chore had to be done constantly, to insure the longevity of the new specimens. Thus, a water line at the poolsite is a recommended extra to situate the plants during the crucial first season.

The daily task is well worth the effort when considering each new specimen is establishing the roots it will need to become a permanent part of a new, natural vista.

●

Beverly M. Miller is a tour guide at the Morris Arboretum. She is also a flower art designer known as Beverly of Hollyoak, and is a member of Ikebana and Ikenobo. She studied horticulture at Temple University's Ambler Campus. She teaches horticulture in the Cheltenham School District.

This section of the landscape is above the pool. Contorted tree to left *Pinus thunbergi;* delicate shrub in the center *Cotoneaster dammeri* 'Skoogholm.'

Are All Those Fantastic Things They Say About Ginseng True?

The author will never tell

by Jan Riemer

Although ginseng *(Panax quinquefolius)* has been used for over 5,000 years by 500 million Chinese as an aphrodisiac, rejuvenator and general cure-all, it has only recently captured my fancy. My curiosity was piqued still further after reading advertisements in the *Old Farmer's Almanac* and other gardening publications suggesting the raising of cultured ginseng roots or seeds as a business opportunity. If George Washington, John Jacob Astor, Daniel Boone and Davy Crockett could do it, maybe I could, too. "Hmm," I reasoned, "$60 to $80 a pound was a pretty fair income, and if it didn't work out commercially, I'd still have a gold mine of health dispensing properties right in my own backyard." Raising a plant that promised, aside from its aphrodisiac qualities, an anti-stress factor, resistance against toxic substances, decreased fatigue, fewer headaches, increased flow of blood to the heart, and a normalization of blood pressure, certainly provided a built-in medicine chest. Furthermore, it was my favorite tea!

According to pharmaceutical houses, the bifurcated root, which resembles the body of a man, has an active ingredient called panaquilon, which is a glycoside. It also contains sugars, amino acids, volatile oils, fatty acids, mucilage and some of the B vitamins such as pantothenic acid, biotin, B-12, thiamine and riboflavin.

The Academy of Sciences in U.S.S.R. have established a permanent commission for ginseng research while an American university laboratory found that some of the compounds gathered from panax were known to destroy cancer cells in mice.

American ginseng can be grown from Maine to Minnesota and south to Georgia but only in forests, heavily shaded tree areas or under bath sheds. We had what appeared to be ideal conditions—two acres of virgin, heavily treed land with filtered sunlight.

When I mentioned my plan to my husband he groaned and said, "Why don't you stick to traditional stuff?" It took most of the summer to clear away the brush that opened a path to

continued

photo by Benjamin

The photograph was taken in the July following the September planting.

my tiny beginner's plot, but he made the September deadline in time for me to plant 300 northern grown stratified seeds. (Stratified seeds are those harvested in the fall and kept in damp sand until the following fall when they're planted.)

Wild ginseng plants, versus the cultured ones, are so scarce that they're being protected by conservationists. They grow in an environment where trees and timber plants share available soil nutrients and water. The growing medium for ginseng must have the same common characteristics of being *well drained* in sandy, clay or loam soil. For our cultured seeds, we chose the procedure recommended for planting in small areas, and buried the seeds ½ in. deep, 4 in. apart in rows separated by a foot, and then covered the bed with a 2-in. mulch of rotted leaves. What could be more simple?

The following spring we eagerly ventured forth to uncover the bed to see if the seeds had germinated. Much to our delight, about 50 little plants had poked through the soil to greet us.

Because it takes the roots about five or more years to develop into commercial size, however, our patience was only beginning to be tested.

One of the greatest hazards to ginseng growers is that both the seed and the root are attractive to mice who devour the tasty flavors that scientists claim protect them against strychnine poisioning. To avoid such destruction, it was suggested that we rig up a tubing to lay horizontally on the soil and fill it with poisoned flax seeds, but as a purist and organic gardener this method was unappealing. Upon further investigation we learned that wormwood *(Artemesia absinthium)* plants protect ginseng against rodents equally as well. The other pest that often plagues commercial growers is the ginseng diggers, who of course, share the responsibility for extinguishing wild ginseng crops.

My plan when purchasing the seeds, rather than one or two year old roots, which were considerably more expensive, was to harvest the berries from the more vigorous plants that produce seeds during the second or third year of growth. (The plant doesn't bear seed the first year.) Towards the end of the summer, the green berries ripen into red indicating that the one or two seeds within the berry should be planted. These seeds lay dormant for about eighteen months.

Harvesting the matured roots is sometimes possible after the third year if optimum growing conditions have existed; however, if allowed to remain in the garden for another year, the plants would provide the most prolific production of seeds. After about 10 years, the root of a cultivated panax plant begins to deteriorate. There's some controversy over the life expectancy of the esteemed wild roots. According to botanists, it may vary from 100 to 200 years, while an old Chinese legend claims 1,000 years of longevity.

The roots are harvested in the fall when they become dormant. After gently washing away the soil, they are placed, without crowding, on a screen and allowed to dry in a light and airy place away from direct sun. At no time should they become damp from humidity as it will effect the quality, and consequently, their value. The roots are dry and ready for sale when they become brittle. An average dried root weighs about an ounce. Any underdeveloped roots should be replanted immediately before drying out.

Unfortunately, my accumulated knowledge about harvesting ginseng roots will never be put to the test. My heartbreaking discovery took place in November when I went into the woods to give my new seedlings an additional winter mulch and found they had all disappeared. Was it the mice? Did too much sun filter through? Could it be the leaf and stem disease that wiped out the ginseng crops in 1904? Or could the Russian Institute of Experimental Medicine be correct when they say that ginseng grows only in radioactive soil?

Until the intriguing mysteries of this ancient herb are unraveled, I can only keep asking, are all those fantastic things they say about ginseng true?

Sources

Collins Gardens
Viola, Iowa 52350

Pulvermacher's Ginseng
250 West Court Street
Richland Center, Wisconsin 53581

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Jan Riemer, author of *The Beginner's Kitchen Garden,* writes a syndicated garden column and magazine articles for state and national magazines.

A Shocking Defense of the Garden

by M. M. Brubaker

As a garden plot is improved and enriched, everything there tastes better to the rabbits than what grows elsewhere. The most serious pests for many suburban gardeners are the mammal invaders. Mammals are more elusive than insects. Even gardeners who flagrantly kill insects may hesitate to kill such a beguiling animal as a raccoon. Shooting is not as effective in controlling animals as people hope. At best it is only a temporary deterrent. Rabbits are designed to withstand a high rate of elimination and still prosper. Furthermore, animals constantly move into any area where the food is abundant.

I once worked on the possibility of using lion manure as a deer repellent. . . . The lion man at the zoo said my deer had not seen a lion so they would not be repelled.

Those "Have-a-Heart" traps may catch the animals, but that justs brings on another problem. Somebody always rushes to ask, "How did you dispose of the animal?" One gardener borrowed one of my "Have-a-Heart" traps and returned it with a groundhog in it. Releasing the animal some distance away may not solve the problem either. A suburbanite north of Wilmington said he had taken more than a dozen squirrels over to the woods on Garden of Eden Road and let them loose, but they didn't seem to like it there.

A number of years ago a neighbor found me trapping raccoons in my corn, and asked if he could have the next one I caught. That seemed like a good solution to the disposal problem. Later on he wanted the next one and the next one also. I finally asked what he was doing with all those raccoons. He said they kept getting out of his cage. He didn't know that raccoons are escape artists.

The only solution to the problem of mammals in the garden is an effective repellant. I have tried about all the garden repellants I could find, and the only one that has so far proved practical is an electric fence. The buried jug which is supposed to repel rabbits with a low-toned whistle is worthless. My animals soon learn to enjoy scarecrows. I once worked on the possibility of using lion manure as a deer repellant, after reading a report about such use in the far west. The lion man at the zoo used up a long phone conversation suggesting other ways of dealing with the deer problem, including tabasco sauce. Besides he said my deer had never seen a lion so they would not be repelled. He never did tell me what they did with the lion manure.

I suspect dried blood may repel some rabbits, but it might attract raccoons and some other animals. Plants sprayed with the dithiocarbamate type of repellant or with nicotine are not good tasting for animals or humans. The flavor of either on lettuce is especially distasteful for me. Each of these repellants has to cover the plants pretty thoroughly, and must be reapplied frequently, even when used with a sticker.

I tried the idea of planting a row of soybeans around the garden. The animals are supposed to fill up on this plant, which they are very fond of, and go away happy. The trouble was rabbits and groundhogs chewed up all the bean plants as soon as they sprouted above ground. The "protection" beans

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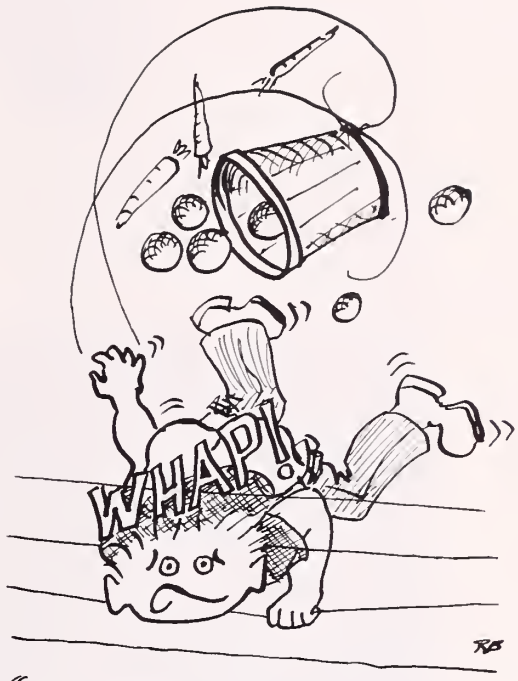

"... A RUDE SHOCK UNTIL YOU REMEMBER TO TURN THE FENCE OFF..."

A Shocking Defense continued

required protection. Fields of beans surrounding the garden might help, but even then the animals would probably go into the garden for variety.

Putting an electric fence around the garden does require an additional investment. One thoughtless visitor asked about the net cost of our vegetables. I suppose he wanted me to account return on investment and obsolescence in addition to the value of my time. I could only wonder what his quail cost a pound from a shooting expedition in South Carolina, or the cost of muskalonge caught at Sioux Lookout, Canada. Labors of love and regalements should not be subjected to accounting.

An electric fence impedes garden work, and some details of construction can reduce this inconvenience. I have been using four wires, but it is possible that only three will keep out all the animals around here. The lowest wire is about 8 or 10 cm. (about 4 in.) above ground. This must be pretty close to ground to keep out baby rabbits. The next wire has been about 20 cm. (8 in.) high. These two wires should keep out rabbits, groundhogs, raccoons, skunks, and squirrels. The third and fourth wires have been about 50 cm. (20 in.) and 90 cm. (36 in.) high.

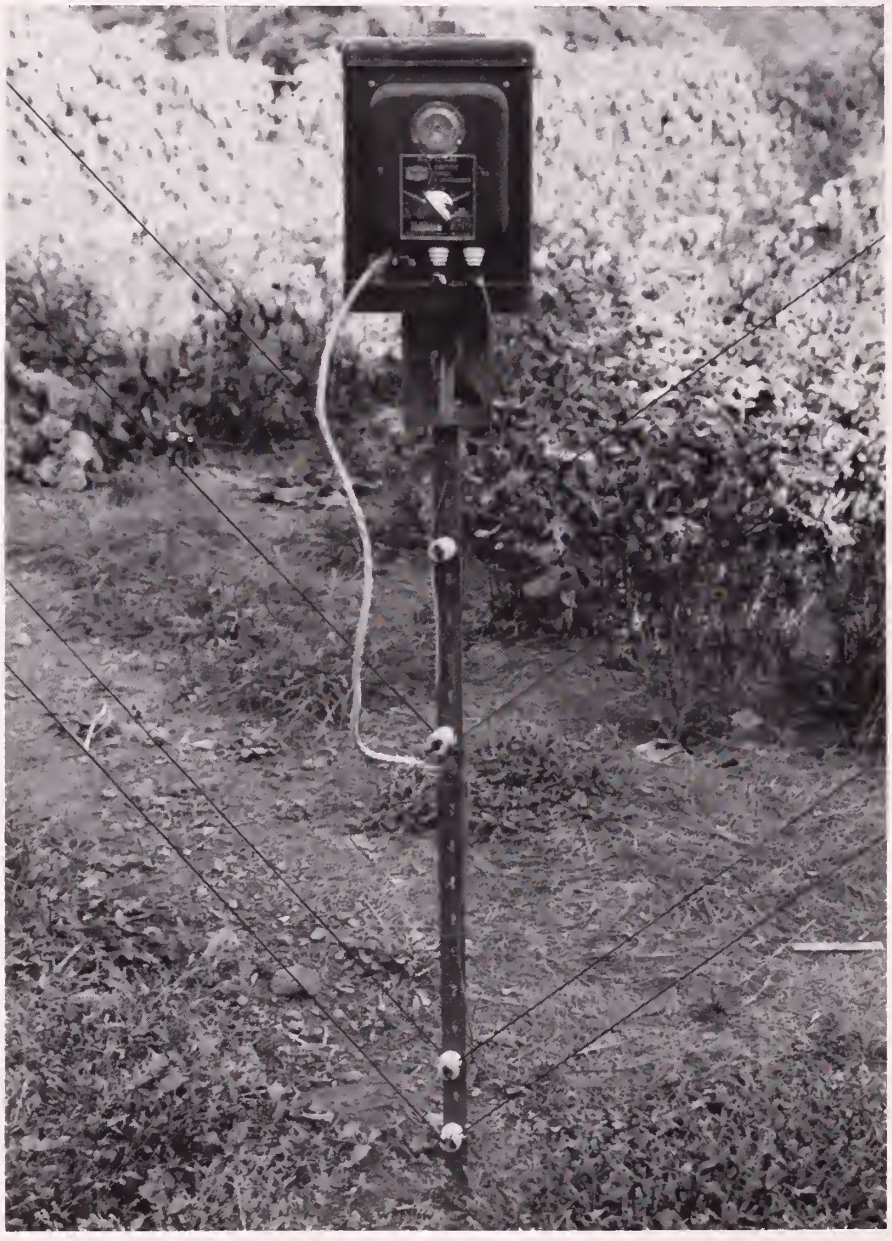

photo by M. M. Brubaker

A deer can, they say, hop over a two meter (about 6 ft.) fence with ease. My deer have not yet learned to go over the 90 cm. wire. I think they put their nose on the wire to see what it is like, and decide that is not the place for them. Since putting up the fence four years ago, I have had no damage. Before

Even gardeners who flagrantly kill insects may hesitate to kill such a beguiling animal as a raccoon.

that the raccoons made a shambles of my sweet corn; rabbits ate the lettuce, beans, cabbage, and beets. The deer chewed on most everything but the tomato plants and onions. I still see many deer in the orchard surrounding my garden.

An electric fence disrupts the garden routine. You are in for a rude shock until you remember to turn the fence off before working in the garden. The neighbor's dog will probably go home yelping at least once. It could be considered a neighborhood hazard in a congested residential area.

I use a "gate" of spring hooks (sold at farm supply stores) at one end of each span of wire. This keeps wires taut, and makes it easier to take them down for garden work. The fence posts are spaced about 4 meters (a little over 12 ft.) apart. I use a type of insulator that allows easy removal of the wires for bringing in cultivating machines or wheelbarrow loads of mulch. A clean, weed-free area should be maintained under the fence wire to prevent grounding. This requires regular patrolling with a hoe or use of weed killers. The wires should also be kept a meter or more outside the growing area to prevent grounding by large plants like corn, tomatoes or cucurbits.

I'm not sure I have yet encountered all of the possible garden pests, but the game is still fun.

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M. M. Brubaker is an adventurous and knowledgeable horticulturist whose plantings are varied enough probably to qualify as a mini-arboretum. In addition to the unusual and interesting woody plants around the house, he has four greenhouses where he grows orchids and chrysanthemums. He is generous with his plants and ideas and is a frequent and welcome contributor to *Green Scene*.

TRAVEL BOOKS THROUGH GREEN BIFOCALS

of plantain, grass, prickly pears and Indian pipes.

by Mary Lou Wolfe

Travel for me in my early years meant the pilgrimage from Evanston, just north of Chicago, through the smelly refinery town of Gary, Indiana, to the sand dunes at the foot of Lake Michigan. The appeal of the dunes was its closeness (depression budget) and its unique plant communities which held relics of the last glacier. Although my father told me about glaciers, what I was really interested in was beating out my older brother in spying the special plants we had been taught to recognize. I became the eagle eye of the Indiana Sand Dunes, the advance messenger announcing rattlesnake plantain, prickly pear cactus, Indian pipes and poison ivy. My brother got even by finding Indian arrowheads in the "blow-outs," the wind-carved bowls along the lakeshore. We both absorbed a lot of botany and ecology from my bifocaled gardener father who made us think those dunes were mountains and that the Middle West was surely one of the world's most fascinating places. As I ventured further and discovered that real mountains had something on sand dunes and oceans were at least as interesting as Lake Michigan, I found that the "green eyesight" I had acquired as a child could be sharpened and extended by some well-chosen books.

Now, as a bifocaled gardener/librarian, I'm discovering the wide range of books that enhance gardeners' travels. Some can be enjoyed whether your trip is a gleam in your eye or a blister on your heel. They whet your appetite, provide historical perspective, and help you prepare for horticultural outings over dune, mountain and ocean. Another group of books provides the specifics for travel: which gardens are open when; where can a fuchsia enthusiast be sure of seeing fuchsias; how to find interesting horticulture in out-of-the-way places; how to "green up" a trip that's mostly business.

Two books, which my predecessor Julie Morris introduced me to, remind me of my father's horse-sense and humorous approach to plant lore and definitely produce the urge to travel. May Thielgaard Watts, in *Reading the Landscape,* is talking about America, explaining the "blow-outs" in my sand dunes, how to spot pioneer wagon tracks, and where to look for native prairie grasses. In *Reading the Landscape of Europe,* Watts introduces "roof-reading," a passive skill that helps you predict vegetation and climate and even speculate on lifestyles under the roofs you watch. I wish May Watts had lived long enough to produce *Reading the Landscape of the Orient.* She would have been carried away with roof-reading in China—the thatch, upturned eaves, ornate tiles and dragons. Actually, little about Chinese gardens has been published since Oswald Siren's 1949 *Gardens of China.* Siren's photographs, taken in Peking and Suchow between 1922-1934, show latticed balustrades, a prince with a parrot, a boat made of marble and moon gates. We enjoy the book as a classic but wonder "what's left?" Maggie Keswick has the answers in her beautiful book *The Chinese Garden,* published in October, 1978. This woman, who we judge from the dust jacket does **not** need bifocals, has produced an up-to-date, handsomely illustrated study of Chinese gardens in the tradition of Siren's work. Keswick's family had lived and worked in China for over 100 years. Starting in 1961, she accompanied her parents during their visits in parts of China not then accessible to most foreign travelers. One message of this elegantly illustrated book is that "a number of very old and beautiful gardens have survived the wars and revolution against all odds, and today are open to the public." Siren's Prince Pu-ju with parrot has returned to mother earth, but the latticed balustrades, moon gates and marble boat survive. Siren in the '40's mourned that "these exclusive pleasure parks have been turned into popular recreation grounds with tea houses and restaurants where meals are served for *profanum vulgus.*" Keswick's book will make you want to become part of that *profanum vulgus,* and see what the Peoples' Republic of China is doing with its garden heritage.

Hikers on the Appalachian Trail may agree with Brook's description of the tower on Clingman's dome "which looks as if it might have been designed by some not-quite-jelled student of Frank Lloyd Wright."

the year of the garden in Britain

In the opposite direction but with the same historical perspective on the present, is Keith Mossman's *Shell Book of Rural Britain,* published in 1978. Although the format is modest, the excellent text and photographs ranging from the 1870's to the present, relate old skills and sights to those the traveler will see today. We note that the shape of pigs has changed (bred from slim to square for more meat) and learn that yews in a Gloucestireshire churchyard were planted as timber for medieval long-bows. Do you suppose the rural Britons turned those yew bows on the ancestral pigs? Think of the new insights you'll have if you decide to be a fly/drive visitor to Britain. It may be an irresistible choice in 1979 for the year is officially designated as "the Year of the Garden" and will be celebrated with all manner of special events and a marvelous exhibit at the Victoria and Albert Museum. On top of all that, the *National*

continued

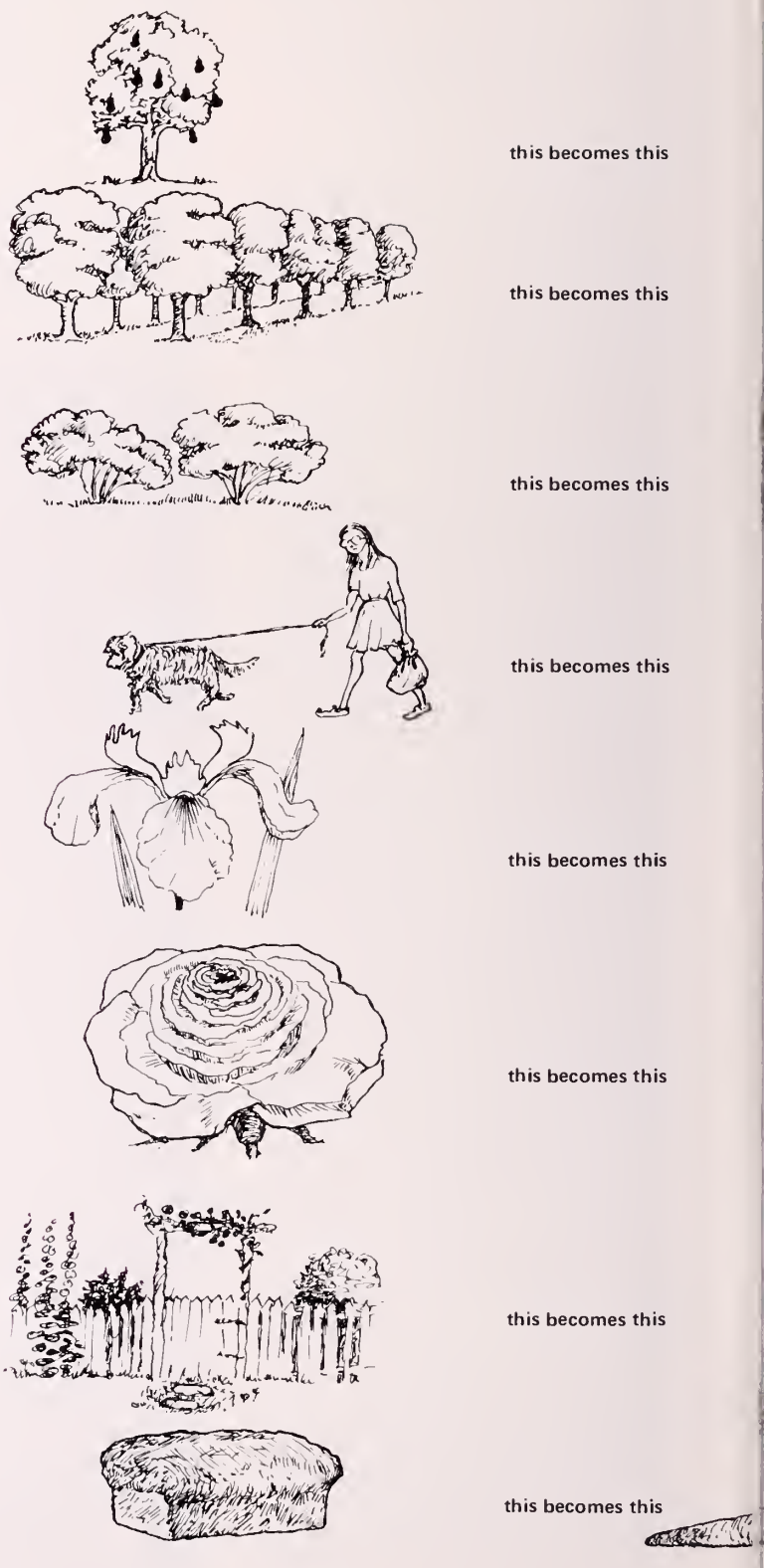
TRAVEL BOOKS continued

Trust Guide to England, Wales and Northern Ireland has been revised (1977).

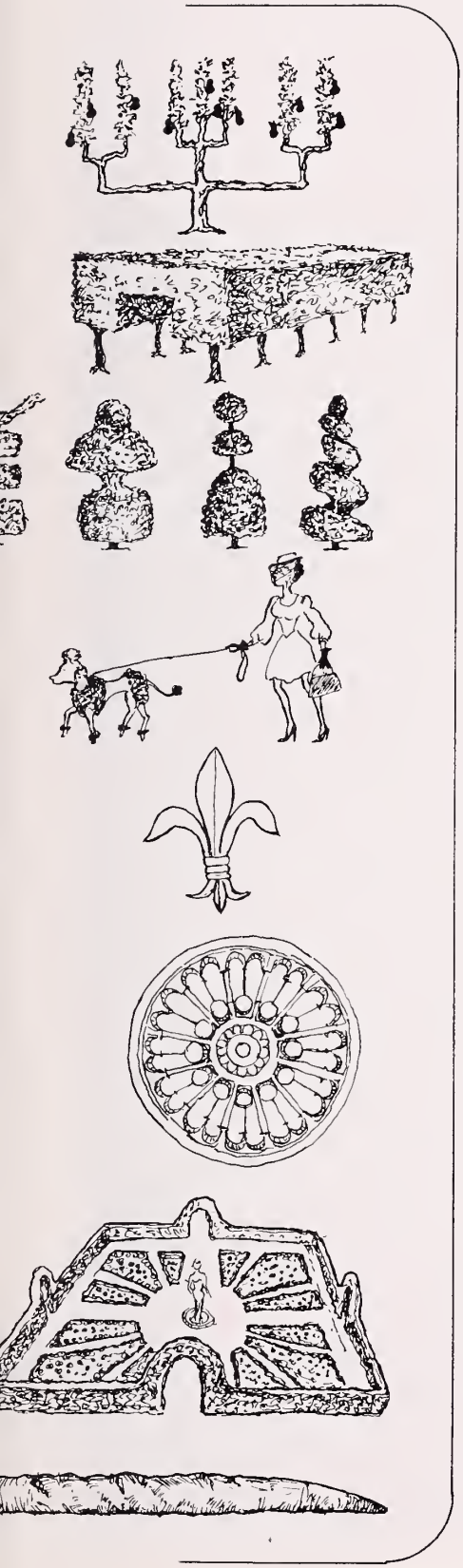
If you resist the lure of the orient and "the Year of the Garden" you can still have some great adventures with *Into the Wilderness.* PHS got wind of this new book when the National Geographic Society began researching and photographing Bartram materials in Philadelphia. William Bartram is one of eight explorers whose travels are described and illustrated in this attractive book. Travelers, especially those with children, contemplating a trip west, will enjoy passages like this in which Lewis, on the Lewis and Clark expedition, tells of meeting 60 Shoshoni warriors: "We wer *[sic]* all caressed and besmeared with their grease and paint, till I was heartily tired of the national hug." Choose a chapter about the particular area you're headed for and *Into the Wilderness* will ease the interstate blues.

If, like PHS, you decide it's time to retrace parts of the Bartram trail, you'll enjoy Maurice Brooks's *The Appalachians.* Brooks does justice to the entire Appalachian range from the Gaspé peninsula to Georgia, but he is especially eloquent about the Smokies. Hikers on the Appalachian Trail may agree with Brook's description of the tower on Clingman's dome "which looks as if it might have been designed by some not-quite-jelled student of Frank Lloyd Wright. There is no doubt about it, an invalid's wheelchair can be pushed to the top." You just may be glad that ascent is tame and with this book, you can identify the mountain cranberry at your feet, 6,620 ft. above sea level.

None of the books mentioned so far give travelers the specifics you'll eventually need once your general travel direction is chosen. If headed to the British Isles, you'll have a number of recent, easily carried books to choose from. *The Shell Guide to Gardens,* by Arthur Hellyer (1977), provides specifics on British and Irish gardens open to the public. This guide will orient you toward the remaining Jekyll gardens or to those which display "Victorian" gardening techniques, among others. For more specific areas in Britain, consider Allen Patterson's *The Gardens of Bri-*



READING THE LANDSCAPE OF EUROPE



tain: Dorset, Hampshire and the Isle of Wight (1978) or Peter Law's *A Guide to the National Trust in Devon and Cornwall* (1978).

The guides just described are all quite new but they can't replace Dorothy McFadden's *Touring the Gardens of Europe* (1965). This is the book to consult if you are planning a trip focused on fuchsias, alpines, cacti, or outstanding collections of a number of other plant specialties. McFadden is also the source for the "wheel tour," arranging your garden visiting from one central point, with day trips radiating in all directions. Fewer blisters on the heel and your "drips" will have a chance to really dry.

unusual gardens in America

Pursuing the specialty interest approach on this side of the ocean, Dorothy McFadden has produced *Oriental Gardens in America* (1976). Thirty states have public oriental gardens and this guide provides exact locations, hours, entry fees and inspiration. McFadden's book is part of a group of library materials at PHS, which I consider "sleepers" in the sense that they provide horticultural visiting ideas for travelers heading for areas about which there is little garden-oriented guide material. McFadden tells you what to do with some extra hours in Austin, Texas, or Akron, Ohio.

John M. Fogg, Jr., in the *Newsletter of the Arboretum of the Barnes Foundation* alerts you to botanically interesting places in Iceland, Sicily, Trinidad and the Ozarks, to name just a few. Although you may not have entree to all the institutions and individuals that welcome Helen and Jack Fogg and their merry band of botanists, you will have brief, illustrated accounts of places to include in your itinerary and the unique plants to watch for. Adding to the travels chronicled in the Barnes *Newsletter,* the earlier accounts in the *Morris Arboretum Bulletin,* the Foggs have covered the world. The Newsletters are on reference in the library, fondly and irreverently titled "Following Fogg's Footsteps."

Three more small booklets that might "green-up" a drab trip deserve mention. First, the *International Directory of Botanical Gardens II* (1977) arranges listings by country and details special collections, rainfall, temperature range, directors, and the specifics of addresses and hours. Even the incomplete listings are significant. Nine botanical gardens are listed for China: for all but two, the director is listed as "unknown."

Much less esoteric and more useful on the spur of the moment are two familiar guides that may end up in your glove compartment. The Brooklyn Botanic Garden's *Handbook on American Gardens* (revised, 1977) is a regional directory that includes Hawaii, the Virgin Islands, and Canada. The Brooklyn *Handbook* lists 12 points of interest in Philadelphia. The Garden Club of America's 1976 *Guide to Public Gardens* lists gardens by states within the zones in which GCA has chapters. Since that leaves out many of our National Park and National Monument areas, there are some regrettable omissions. On the other hand, Philadelphians

Do you suppose the rural Britons turned those yew bows on the ancestral pigs?

will be pleased to see among the 24 Philadelphia area listings, The Tinicum National Environmental Center, Ridley Creek State Park, and the Pennsylvania Horticultural Society. Either Brooklyn's or the Garden Club of America's guide would be useful. Test them yourself to see how each lists an area you know well. For me, the check will be Indiana. No dunes listing in Brooklyn's guide. Now, let me check GCA's *Guide.* "Indiana Dunes State Park, near Chesterton on Route 49 North of Routes 12 & 20. 2,182 acres containing nearly every variety of midwestern plant life." It makes me want to shine up my bifocals and check up on the rattlesnake plantain, prickly pear cactus and Indian pipes. Skip the poison ivy.

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Mary Lou Wolfe is PHS's horticultural librarian.

GREEN ANTIQUING

by Deni Seibert

In answer to my knock at the strange door in Mt. Holly, New Jersey, a head appeared and said, "What do you want?"

"I am wondering if you could give me any information about that historic Cripps Oak across the street?" I inquired.

"That old thing? I have lived here for 15 years and didn't know it was anything special," he answered.

That "old thing," gassed with exhaust fumes, roots cut by traffic and hollowed out by fires, was mentioned as a corner tree on a land survey made by Daniel Leeds, April 18, 1681, for John Cripps.

Typically, our lives accelerate at such speeds that we seldom pause to appreciate and respect one of nature's noble gifts—the ubiquitous tree.

Like a list of social elite, the National Register of Big Trees (native or naturalized to the United States) lists 661 champions in 39 states and the District of Columbia, including Pennsylvania. Although we don't boast the oldest, we do possess a special category unique to our part of the country.

If trees could speak, what stirring accounts might be whispered through the leaves of our old "Penn Trees." When William Penn arrived in America nearly 300 years ago, he found a land forested with lush growth. Few stands of those virgin woods remain, but some of the original monarchs that he loved and used, called "Penn Trees" or "Penn Oaks*" survive as the only living residents from his time; they are true sentinels of our past.

Well over 100 species of trees are native to Pennsylvania but the oak makes up the greatest number of trees that remain from that era. Many of these giants are found in churchyards or Quaker Meeting Houses, which makes one wonder if congregations were drawn to settle by the trees or whether the trees found sanctuary at the churches.

In 1932, at the time of the 250th celebration of William Penn's arrival, a committee on Penn Memorials was formed by the schools of the Delaware Watershed with Edward E. Wildman as chairman. They measured and described over 700 trees in the four state area, half of which were known survivors of Penn's time qualifying them to be called Penn Trees. Unfortunately, a number of these have disappeared.

Before all of these oldsters succumb to senility, let us be alert to their significance as we travel the area of Penn's activities in Pennsylvania, New Jersey, Maryland, and Delaware.

One of the first actions of William Penn in his new colony was to befriend the Indians and pay for the land occupied by the Quakers. Benjamin West immortalized the most famous Penn Tree in his painting of this event entitled "Penn's Treaty with the Indians of 1682" owned by the Pennsylvania Academy of Fine Arts.

The Methuselah of oaks, spanning the entire history of the white man in the western hemisphere, spreads a quarter of an acre over the Friends' burial grounds in Salem, New Jersey.

The Penn Treaty Elm, under which the pact was signed, stood at Shackamaxon, now Kensington, until blown over in a storm during the 19th century. A scion from the original tree grows in the suburbs at Westtown School.

Although no original trees are left at Pennsbury Manor, William and his family were known to have boated across the Delaware River to Burlington to visit their friend, Samuel Jennings, governor of that province. They attended Quaker Meeting at the Friends' Meeting on High Street. Secluded behind a brick wall in the cemetery at the rear, an old buttonwood *(Platanus occidentalis)* rises like an obelisk over the grave of Chief Ockanickon, the Indian who sold the land to the Quakers in 1677. A great friend of the white man, the chief's last statement, "Be plain and fair to all, both Indian and Christian, as I have been," was recorded on a plaque beneath that tree.

photos by RUDEN

Richard's Oak, 1681, *Quercus alba* prepared for William Penn (Rising Sun, Md.).

the methuselah of oaks

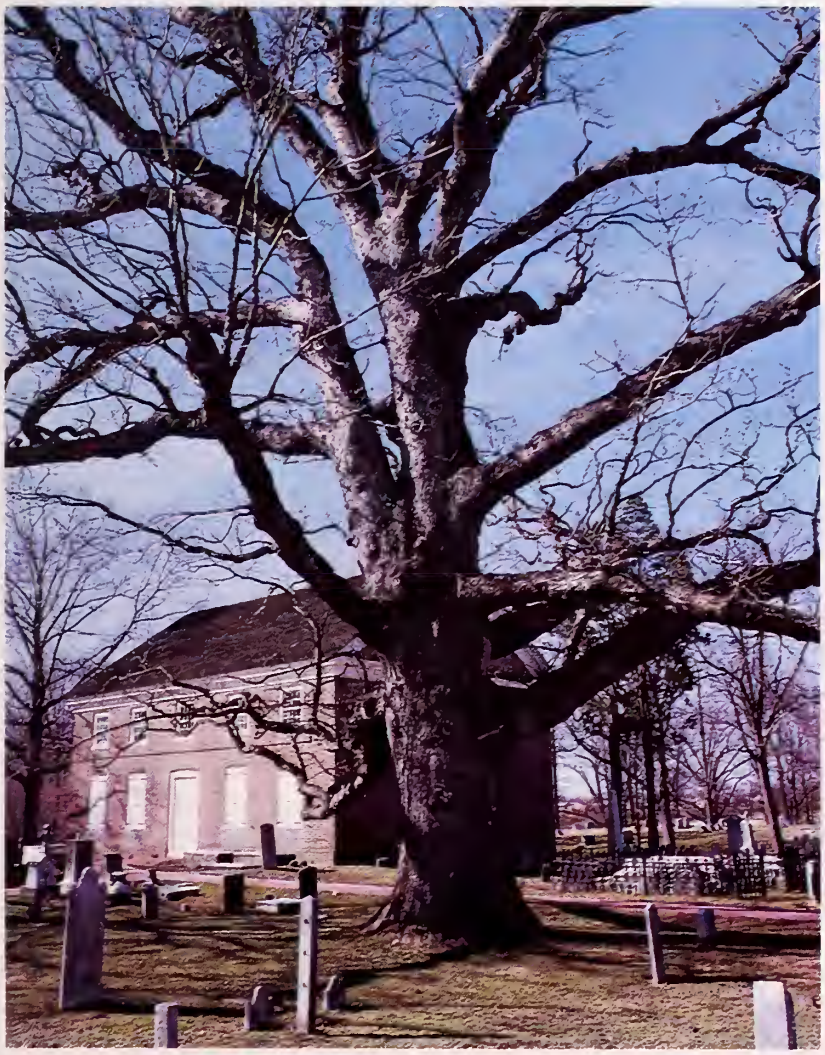
The Methuselah of oaks, spanning the entire history of the white man in the western hemisphere, spreads a quarter of an acre over the Friends' burial grounds in Salem, New Jersey. In 1675, John Fenwick gained this land for his Quaker colonists in a treaty with the Indians consummated under an oak *(Quercus alba)* that already was centuries old. The Salem Oak is noteworthy enough to be recorded on state maps.

Tree-trekking in Pennsylvania can bring year-round pleasure. Examples of handsome oaks may be discovered north of Philadelphia at the Wrightstown Meeting, Buckingham Meeting in Lahaska, Richland Friends' Meeting in Quakertown, and at Gwynedd Friends'

*Not to be confused with the *Quercus robur* planted by William Penn at Guilferd Meeting in England.

Wye Mills Oak, national champion, *Quercus alba*. Only one-tree state park (Wye Mills, Md.).

Burlington Buttonwood, *Platanus occidentalis*, over an Indian grave where Penn visited (Burlington, N.J.).



Old St. Anne's Church oak, *Quercus alba* (Middletown, Del.).

Meeting. The prize for endurance must go to the Drinker Oak, found in the endless swirl of highways at the King of Prussia entrance to the Pennsylvania Turnpike. This 450-year-old titan, named after Ernesta Drinker Ballard's grandfather, was there when George Washington and his troops passed on December 20, 1777, en route to Valley Forge.

South of Philadelphia, William Penn laid out Route 926 using large oaks as surveyor points. Where Chester and Delaware counties converge, the Tanguy Oak distinguishes the boundary as the corner tree. Of several along the road, the most beautifully shaped oak towers above the London Grove Meeting where Quakers, granted land tracts by Penn, first gathered for worship in 1714.

In the charming little town of Marshallton two Penn trees, a white oak and a hemlock *(Tsuga canadensis)*, stand near the Bradford Friends' Meeting. Humphry Marshall, cousin of John Bartram, who wrote the first botanical treatise published in the New World, probably knew these trees well as they grew near his arboretum.

400-year-old buttonwood

Driving along Route 1, which was started as an Indian trail, you can't miss the huge, 400-year-old buttonwood lighted at night by the Brandywine Battlefield Park. The silhouette looms over the 1698 Lafayette Museum where

continued

Drinker Oak, *Quercus alba* with Lee Ann Fisher inside (King of Prussia, Pa.).

the wounded Marquis was brought during the battle at Chadds Ford.

Nearby on the bulky branches of the infamous Dilworthtown Oak spies were hung during the same battle. Today, like a lumpy wrestler, the oak casts shadows on new subdivisions springing up around it.

At the left of the entrance to Longwood Gardens, the old "Penn Oak" was known as one of Pierre S. duPont's favorite trees. It demonstrates good care and conservation where man aids nature in preserving history. More than a ton of cement fills its cavity and like a tooth's filling helps to keep it stable.

During pioneer days, large trees were incorporated on maps as distinguishing landmarks. The Richards Oak, situated on Route 1 a couple of miles west of Rising Sun, Maryland, was pictured prominently as a marker on a map prepared for William Penn in 1681. The old colossus earned its accolades, also, by hosting Lafayette's revolutionary forces on April 12, 1787, by guarding a civil war calvary unit 75 years later, and still the world whizzes by under its branches.

Often in conflict with Lord Baltimore over the boundary between Pennsylvania and Maryland, Penn is said to have climbed a large oak in Calvert, Maryland, to survey a site that he gave for the Brick Meeting House there in 1702. This historic meeting house was converted into a hospital by General Smallwood's division in 1778, and many of his soldiers were left behind in the cemetery. The Calvert Oak has grown so huge that not even adventuresome boys from the school next to it could climb it now.

In 1700, en route to preach at the Friends's Meeting of Third Haven in Easton, Maryland, Penn no doubt passed the Wye Mills Oak. The largest and most impressive tree dating from Penn's time, it holds the title of National Champion white oak in America and is maintained as the only one-tree state forest. This mighty winner has a fence to protect it and a tiny visitor center adjacent to it. Unusual knobby knees protrude from the base of the trunk which measures 30 ft. in circumference. Stories about this romantic tree fill an entire book which dates it around 1540.

Wye Mills Oak: the largest and most impressive tree dating from Penn's time, it holds the title of National Champion white oak in America and is maintained as the only one-tree state forest.

When driving downstate in Delaware, stop at Old St. Anne's Church in Middletown. Shading the entrance at the brick wall, a magnificent white oak wears its metal plaque which dates it from the time of William Penn.

Golfers playing the course at the Hercules Company outside Wilmington may not realize that their balls whizz by a 400-year-old white oak. This tree has been given tree surgery and supporting cables to keep it in prime condition.

Green antiquing to locate, measure, and photograph a few of these special friends of William Penn provides a fascinating link to the past, heightens an admiration of nature's tenacity, and offers a pleasant way to review our history. You may never find them all but you could happen upon one unexpectedly in the middle of Oxford or at Gap on the way to Lancaster. Keep your eyes open.

●

Deni Seibert grew up at the Missouri Botanical Garden where her father was superintendent. She notes that she was transplanted to Longwood Gardens via South and Central America and California. Seibert has written and lectured for 20 years; her work has been published in the *New York Times* and she is a regular travel contributor for the *Sunday News-Journal* in Wilmington. This article was prepared as her bicentennial lecture for the 1976 Williamsburg Garden Symposium.

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Quercus alba – London Grove (Pa.)
Meeting House oak

THE green scene

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Gardens on the Skyline

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THE green scene

HORTICULTURE IN THE DELAWARE VALLEY

Volume 7, Number 5 May/June 1979

published by
THE PENNSYLVANIA
HORTICULTURAL SOCIETY
325 Walnut Street, Philadelphia, Pa. 19106

THE GREEN SCENE, (USPS 955580) Volume 7, No. 5, published bimonthly, January, March, May, July, September, November, by the Pennsylvania Horticultural Society, a non-profit membership organization at 325 Walnut Street, Philadelphia, PA 19106. Subscription: $7.50 — Single Copy: $1.50. Second class postage paid at Philadelphia, PA 19104.

POSTMASTER: Send Form No. 3579 to THE GREEN SCENE, 325 Walnut Street, Philadelphia, Pa. 19106.

in this issue

GARDENS ON THE SKYLINE

A penthouse overlooking Philadelphia and its most beautiful parkway boasts of 6,200 sq. ft. of gardens.

by Ann Jarmusch

Philadelphia skyline will soon be embroidered a bit when an environmental designer's roses, sunflowers, and corn flourish 110 feet closer to the sun than most of their species in the city.

Kenneth Parker's flower and vegetable gardens begin about 10 stories above 20th Street, near the Benjamin Franklin Parkway, on the roof of a recycled granary. Now, the building that still bears the painted name of its original owner—the Tidewater Grain Company—serves as corporate headquarters for Kenneth Parker Associates on the street level, and Parker's multilevel penthouse with gardens. In between these two areas that testify to the firm's bold design capabilities are about 75 empty, apparently unconvertible grain silos.

. . . Parker, seated under a morning glory canopy, has watched the setting sun bisect the art museum's pediment. . .

This towering lost space has not bothered Parker, who was trained at the Philadelphia College of Art. He was the property's only bidder who did not plan to demolish the structure and build a new apartment or office complex. Sold on the entirely unobstructed views of Philadelphia, Parker envisioned the open roof space as lush gardens and decks for entertaining and relaxation.

Describing himself as a hobbyist indulging in "just plain dirt gardening," Parker says, "I wouldn't live in the city where I couldn't garden, so if I wanted a high-rise, roof gardens were the answer."

And roof gardens he has, designed while he cruised the Adriatic. Being the top priority, the 6,200 square feet of gardens came off the drawing board first. Ornamental fruit trees, a stretch of lawn, rose bushes, and a small fountain that a goldfish calls home—these are just the beginning. Parker designed five distinct garden areas on two levels: the south side's sun deck and barbeque terrace, the north side's grassy, tree-lined cocktail patio (where Parker, seated under a morning glory canopy, has watched the setting sun bisect the art museum's pediment), and the top story's twin vegetable gardens. In addition, two greenhouses face south, one doubling as a bathroom, the other as a breakfast room-aviary. As soon as weather permits, Parker will remove the sash from these foliage-filled greenhouses, exposing them to the Philadelphia air.

photos by Edmund B. Gilchrist, Jr.

A terrace and greenhouse 10 stories high in an old granary near 20th and Benjamin Franklin Parkway.

a sky-high jacuzzi and greenhouse

What about exposing Parker to the Philadelphia air? How does it feel to soak in a sky-high jacuzzi? "I'm a little

continued

Above, looking from the south side of the building. Note greenery on left and right sides of building on top two floors.

At left, a jacuzzi provides humidity for a veritable jungle of plants in the bathroom area.

The wind zapped countless seedlings last spring and threatened to blow away some of the garden furniture.

bit crazy," the designer admits. Crazy like a fox, judging from the look of his Boston and asparagus ferns, hibiscus and bougainvillea, which thrive on the constantly whirling jacuzzi's humidity and the greenhouse environment.

Serving the extraordinary outdoor gardens composed of fairly ordinary plant materials is a small work area. With a view of the Delaware River, Parker reaches for tools in rustic-looking, built-in cabinets and pots his plants in a huge double sink with a wide side drain. "It's fabulous," says Parker, "something I salvaged from a restaurant supply house."

How did Parker actually come to be serving dinners under yellow canvas umbrellas with a bird's eye view of City Hall? With the help of engineer William W. Richards, the necessary calculations were made and the reinforced concrete granary pronounced sound. Then the roof was waterproofed. Up the grain elevator went the concrete and cinder blocks that combined to form the serpentine planters that are an integral part of Parker's design.

The soil was next, over a hundred tons of it, trucked in from Malvern, where a special, lightweight mixture of screened top soil and sphagnum moss was prepared. A gasoline-powered hoist lifted the soil to the gardens. With ballast in the bottom for drainage, the planters were filled. Depending on whether they were to hold thyme or zinnias or trees, the planters range in depth from eight to 30 inches.

The rented hoist also delivered the trees. About selecting young birches and fruit trees, Parker explains, "I'd rather let them get big up here." He and Richards have not yet determined the point at which the trees will be large enough to offer hazardous wind resistance. According to Richards, a driving wind storm could develop a 14-pound-per-square-inch force that might uproot the trees and shrubs.

Even in fair weather, Parker considers wind "the big enemy." While conceding that the constant breeze does counteract the intensity of summer sunshine, he says it "zapped" countless seedlings in the spring of '78 and threatened to blow away some of the garden furniture. To combat this perpetual problem, Parker plans to supplement his north-side rows of ever-

Morning glory canopy over swing

Serpentine lawn on north side of building

And he seems thankful to be free of pesky rabbits and squirrels—"unless they press the elevator button."

greens, adding winter color and texture as well as protection.

"It's a hardy garden, it gets abused," Parker says philosophically.

one growing season so far

Having seen his plots through only one growing season, Parker still considers them experimental. His goal in April, 1978, when the first plants and seeds went into the planters, was to achieve a thick, green garden in a hurry. Intentionally mixing flowers and vegetables, Parker relied primarily on annual plant materials to achieve the desired ambiance. Roses bloomed with herbs, tomatoes flourished with sunflowers.

The vegetables matured early—and impressively, recalls Richards, who claims the cauliflower heads rivaled soccer balls. But all that pure sunshine created problems, too. Parker's gardens dried out more quickly than the earthbound ones do, he says. An automatic sprinkling system, with mist nozzles spraying 180°, turns itself on for an hour each night of the growing season. Because each garden has its own needs, there are three separate timers (north, south, and top level) that Parker tinkers with, trial and error fashion.

Drainage presented another challenge to the designer and engineer. Now, water running through the planters and wooden plank walkways, travels

continued

Vegetable garden at top level looking toward the southeast

through downspouts to a holding basin with a screen before reaching the sewer.

Last year, air pollution left no mark on the gardens so far as Parker could tell. He won his war with white flies and aphids by "spraying the hell out of them." And he seems thankful to be free of pesky rabbits and squirrels—"unless they press the elevator button."

Unlike so many city dwellers, Parker is charitable toward the building's messy former tenants. "It was the pigeons' house long before it was mine," he smiles. "A few months ago, a pair built a nest in the bedroom and we had a dickens of a time getting them out." Richards believes that the flock left Parker's crops unraided because "city pigeons don't know what corn is."

More desirable songbirds evidently stick to lower atmospheric levels, because Parker hasn't entertained any of them. Instead, he keeps his own doves, parakeet, and reportedly bad-tempered toucan caged in one greenhouse, where a tabby cat slinks through the cultivated "underbrush."

By design, Parker's gardens possess their own personalities and functions, and their designer gravitates to the spot that suits his mood and needs. How did he relate such distinct areas to each other? "They all have the same curvilinear form," Parker explains, "and the same plant materials run throughout." Indeed, unifying his initial season's penthouse gardens was a generous sprinkling of morning-glories and geraniums, philodendrons and cacti. Hanging plants and trained vines clung to stained wood trellises; others sprouted from baskets and plexiglass boxes. Parker's collection of yellow and white garden furniture—ranging from people-shaped lounge chairs to a chair-swing topped with a morning-glory canopy to wicker dining chairs—also provide continuity.

exterior/interior

And what about relating these gardens to the interior? Parker remained true to his original evaluation of the building's potential by keeping his windows uncovered. Inside, where fresh bouquets beam, there is an overwhelming sense of drinking in the outdoors, be it one landscaped corner or the entire city. Some of the smooth plank walkways move indoors where the moss-green carpet leaves off. And so as not to blind himself to the city lights, Parker has dimmed his garden lighting.

Like any decent designer and horticulturist, Parker has months-old plans for this season. "Of course, I want better specimens, and I'd like a grapevine and need a compost pile." Picking up a pencil, Parker draws another idea: rather than erect yellow canvas awnings, he'll train morning glories to grow diagonally across his trellises.

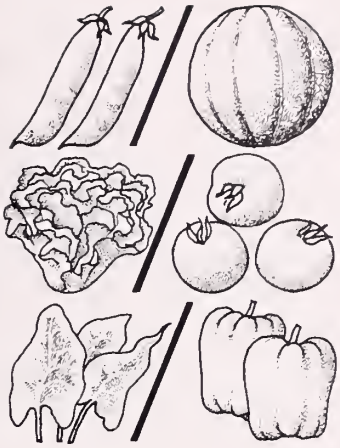
Last October, the goldfish came indoors, evergreens were bundled in burlap, and mulch blanketed the beds. Parker prepared to weather the cold, gray months in his "summer house." After all, his cook Margaret Williams had frozen quarts of homegrown vegetables and soups to last him through the winter.

Soon Kenneth Parker will be on the roof, loading baskets with his second year's harvest and carrying them down the industrial spiral staircase to the kitchen.

●

Ann Jarmusch was publicist for the '78 and '79 Philadelphia Flower & Garden Shows. She is now associate editor of *Réalités* Magazine.

DOUBLE CROP GARDENING



The author and her husband enjoy vegetables from the garden at least nine months of the year. She adapts another writer's plan and shares some good ideas of her own.

by Jane Pepper

Our first attempts at vegetable gardening were primitive. One Memorial Day weekend we purchased a market pack of tomatoes, stuck them in what passed for the flower border, sprinkled a little water on top and left them to flourish or perish. The huge crop of tomatoes that resulted from those six plants had little to do with our skills as gardeners, but it was enough to hook us both on vegetable gardening. Today the tomatoes no longer struggle in the flower border, and we enjoy fresh vegetables at least nine months of the year. The vegetable garden is not large (1,500 sq. ft.), but it produces an enormous amount and variety of vegetables. Our key to productivity is to keep replanting a series of crops from earliest spring to late summer.

An article by Henry Mirick in an early issue of the *Green Scene* * opened my eyes to the possibilities of double cropping—an experience for which my childhood gardening efforts in Scotland had not prepared me. In that chilly climate, the season is long but growth rates are relatively slow, and the gardener uses his land only once during the season. Mirick wrote of all sorts of fascinating possibilities for the small garden—and he included a plan. The first summer we copied his plan religiously. Some crops were not too successful, but his ideas encouraged us to keep trying a wide variety of vegetables and growing methods to get the maximum use from our small garden.

As late as the first week in December, 1978, we had a salad of Bibb lettuce, Chinese cabbage, red cabbage, spinach and broccoli.

Our fresh vegetable season begins in mid-April with asparagus. It took us several years to commit the 200 sq. ft. necessary to plant 75 asparagus roots, but after the second full year of picking we are delighted we took the plunge. Seventy-five roots don't allow us to invite anyone but our closest friends to dine off fresh asparagus, but it is the earliest vegetable, and can be harvested until late June. Usually we finish cutting in early June by which time there is an abundant supply of peas.

peas are hardly worth the trouble

Despite warnings from several wise old gardeners that peas are hardly worth the trouble in the Philadelphia climate, we consider this an excellent vegetable for the small garden. Not only are fresh peas a gourmet's delight, but once they have produced their bounty you can tear out the vines and replant late summer and fall crops. In addition, the nitrogen fixing bacteria that thrive on the roots of peas and other leguminous crops, enhance the fertility of the soil. Despite the large amount of vegetables we harvest from our garden, we rarely use commercial fertilizers and have never had problems with a deficiency of nitrogen. I attribute that in part to our many rows of peas. We aim to have the first peas in the ground by St. Patrick's Day. Even in the spring of 1978, after that wicked winter, we were only 10 days behind schedule. We turn over the ground in the fall and, if the soil is wet, stand on a long wide board to plant the seeds. This spreads the planter's weight evenly and avoids excessive damage to the delicate soil structure. Throughout the end of March and until mid-April we continue to plant peas at two-week intervals. At the beginning we plant the early-maturing varieties such as Burpeeana Early, and then switch to those that can withstand warmer weather, such as Wando. My husband Wing, the family pea sheller, is especially fond of a variety called Green Arrow. To an expert pea sheller those long well-filled pods are superior. This year we plan to try the All-America winner Sugar Snap peas.

Always proud of his gardening successes, Pepper the pea sheller has been heard to say to friends that he had 460

continued

photos by author

Carrot yield November '77

*"A Three-storied Vegetable Garden," March/April, 1973)

Scottish sprinkler hose laid out in the garden

linear ft. of peas in his garden last spring. I would hate to shatter the image his friends must have of the enormous garden Pepper had to hold all these peas. The secret to the large footage is that we plant double rows, spaced 6 in. apart, with a support for the peas to scramble up between the two rows. Not being able to obtain those pea sticks they mention in gardening books, we find that a line of 3 ft. high chicken wire between the two rows makes the most effective support. For a couple of years we tried the dwarf varieties, which the seed companies claim need no support. The results were disappointing because, without support, even these varieties don't seem to grow as well. If you make the effort to erect the wire you might as well reap the added benefits from a standard variety.

Our 460 ft. provides us with more fresh peas than we can possibly consume, and many are stored in the freezer for the following winter. Some vegetables, such as string beans and beets, become so watery that we think it a waste of time to freeze them. Peas, on the other hand, lose little of their flavor, color and texture.

Each year we allocate approximately 450 sq. ft. of garden for tomatoes and lima beans, in rows placed 4 ft. apart (see diagram). As we lay the garden out in March we plant the double rows of peas 4 ft. apart and leave the rows in between open for planting tomatoes and lima beans. In the early days we optimistically planted peas in the tomato and lima bean rows. This never worked because even the earliest peas aren't over until mid-June — two weeks after the best time to plant tomatoes. Leaf crops such as lettuce, mustard, and spinach can be successfully planted in the rows designated for tomatoes and lima beans. As with peas these can be sown in mid- to late-March and harvested from late April until Memorial Day.

If you plan to leave root crops for winter harvest be sure you mark the rows with a stake. It's hard to find your supper under six inches of snow.

Another section of the garden is planted with early-maturing crops such as string beans, kohlrabi, broccoli, beets, cauliflower and cabbage. All of these mature by early July and following the glorious Fourth, we begin to dig and replant with crops that will supply us with fresh vegetables until Christmas.

the airborne hose

The results from our first couple of attempts at summer replanting were disappointing. In the long, hot days of summer germination was spotty and the fall harvest very small. I suspected this was due to lack of water, but we were always too lazy to do a good watering job. A late June visit to my parents in Scotland solved the water problem. As they were planning to move to an apartment that fall, my mother was sadly facing the prospect of having to give away some of her most treasured possessions—the lawn mower, the rototiller, the endless spades, forks and rakes a family can accumulate over 30 years of gardening — and 100 ft. of sprinkler hose. How those stewardesses and passengers stared as I carried the reel of hose on board the plane in Edinburgh. My timing was just right. Soon after I returned to Philadelphia we replanted the gar-

den with fall crops, and laid the sprinkler hose between the rows.

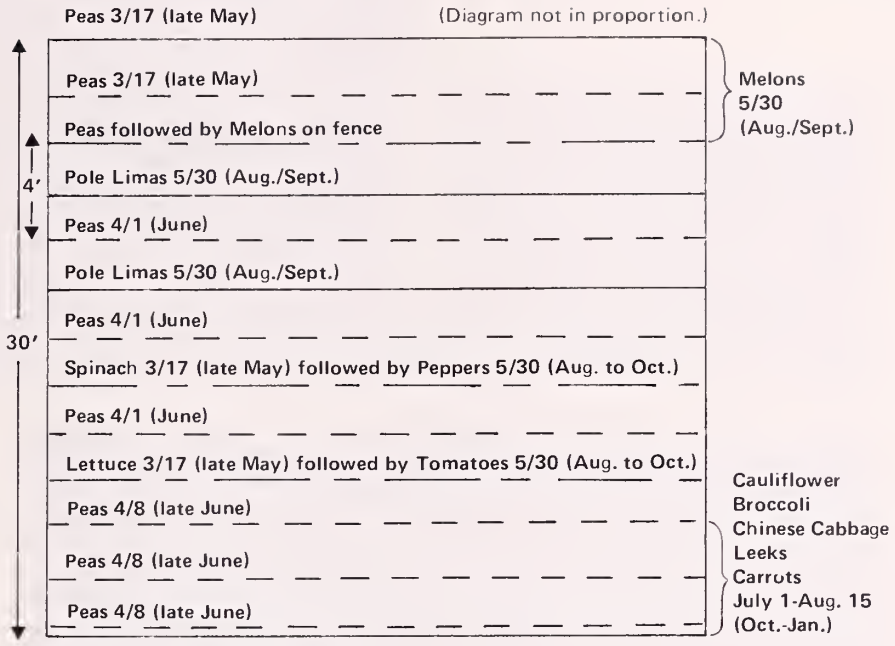
Now our summer watering chores are easy, and we are able to maintain a moist seedbed until the crops are well along and then cover the soil between the rows with a heavy leaf mulch. The results have been sensational. Throughout the fall we have a wide variety of vegetables to choose from, and as late as the first week of December, 1978, we had a salad of Bibb lettuce, Chinese cabbage, red cabbage, spinach and broccoli. Our vegetable that evening was the fall staple — carrots.

The first few years we used to plant carrots in the spring, and were rewarded by row upon row of pitted and distorted roots. The carrot rust fly was unimpressed by our sprays and dusts. In despair, we followed the advice of George Abraham, the author of our favorite vegetable gardening book *(The Green Thumb Book of Vegetable Gardening,* Prentice Hall, N.J.). Abraham suggests avoiding the rust fly by delaying carrot planting until after June 1st. Since adopting this schedule we have had bountiful crops of fall carrots.

We plant the seeds at two-week intervals from early July to mid-August, lazily turn on our Scottish sprinkler hose once in a while, and leave the carrots to develop. Instructions on seed packets and in some gardening books suggest you thin the seedlings. We have found the yield to be much greater if we skip this tedious task. Obviously this is not the way to grow straight, fat carrots to win a blue ribbon at the Harvest Show, but it is amazing what large carrots grow seemingly one on top of the other. Two of our favorite varieties are Imperator and Nantes Half Long. In 1977 we dug most of the crop before Thanksgiving and stored them in sand in the garage. By January they were only suitable, as were those stored in the freezer, for soup and stews. Last fall we covered the rows with eight inches of shredded leaf mulch and were still enjoying fresh carrots in mid-January. If you plan to leave root crops for winter harvest be sure you mark the rows with a stake. It's hard to find your supper under six inches of snow.

Other gardeners have their favorite fall vegetables: leeks, brussel sprouts, cauliflower, cabbage, beets and parsnips all merit space. Of the leaf vegetables suitable for fall salads, spinach is probably the most frost resistant.

SCHEMATIC DIAGRAM OF 1979 GARDEN



A portion of the Pepper garden. This diagram has been adapted from the 1979 plan and is intended only as a guide to readers. Other vegetables are grown in another part of the garden.

Although I could never reproduce as orderly a plan as Henry Mirick did for his "Three-Storied Vegetable Garden," I do make a plan in late winter for the early spring and summer seeding and planting. The fall planting is usually done in a more haphazard fashion depending on what seeds we have left from the spring sowings. Before frost, however, we incorporate all the fall crops into the original plan. In any vegetable garden it's important to avoid planting both cole (cabbage, cauliflower, kohlrabi, brussel sprouts, kale) and solanaceous (tomatoes, potatoes, eggplants) crops in the same place two years in a row. Both these plant families are susceptible to diseases that overwinter in the soil. Crop rotation and use of resistant varieties are the best ways to avoid excessive damage from these diseases.

Squeezing the most out of your vegetable garden becomes a game you can plan all year-round. During the winter months you can study the seed catalogs and doodle on a big sheet of paper entitled Vegetable Garden Plan — 19?? Around the middle of March you begin to watch the weather forecasts and everytime you pass the vegetable garden you squeeze a handful of soil in your fist. If it crumbles when you drop it, it's suitable for planting. If it stays in a sticky ball, you retreat inside and try again in a few days. This old-fashioned soil test sounds so simple, but we always have endless discussions as to whether the ground is ready for planting. Generally the pea fanatic can't stand winter any longer and sneaks out to plant his peas despite my mutterings about the delicate condition of the soil. During the spring and summer you play your game continuously, taking advantage of every inch of garden space. Don't sit around in late summer wondering if it's too late to plant. Go ahead and gamble on a few packets of seed. Some years they won't make it, but last year the warm fall brought large rewards to late planters.

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Jane and her husband Wing garden in Media, Pa. She writes a gardening column for the weekly (Thursday) *News of Delaware County.* She is secretary of the Campus of the Haverford Arboretum Association.

PERENNIAL GARDENS

by Landon Scarlett

If you want to make a beautiful garden and you live in the Delaware Valley, consider herbaceous perennials. They add a unique richness to gardens. To use them successfully, however, you should know them intimately.

Two local gardens have convinced me that perennials deserve to be promoted enthusiastically. Both gardens feature perennials extensively but by no means exclusively. Both are being made by first-class plantsmen whose objective is not to collect plants but to use them to enrich visual impact. The design "bones" of both are excellent—a prerequisite to success in any garden.

One is located in Chester County, Pennsylvania, and belongs to Sir John Thouron who concentrates most of his garden energies on flower borders and neatly mown lawns in the English manner of the nineteenth and early twentieth centuries. Sir John has spent the past 20 years developing his borders, experimenting, and seeking to capture the British effect by adapting his gardening techniques and choice of plants to Chester County's climate. Not an easy task. Sir John strives for perfection, recognizes and appreciates the best, and is not satisfied with the ordinary in life or in his garden.

the impact of borders

As you know, the impact of flower borders depends on skillful color, texture, and size combinations. Most people think immediately of annuals to produce color in the garden, and indeed, Sir John uses annuals beautifully (though rarely the usual kinds). But many annuals don't come into their own until July, and they peter out by September. What you find at Sir John's throughout the growing season is a garden alive with color and breathtaking to see. He masses everything in his vast borders—colored-stemmed shrubs for winter effect, bulbs, biennials, annuals, perennials, in fact anything that works. But the gems of his garden, which produce much of its wonderul color and its textural excitement, are the herbaceous perennials, some with giant stature, some small, some bold, some meek and delicate, all adding up to a gradually but constantly changing picture that is full of rich detail.

Sir John Thouron takes advantage of the fact that perennials come in an almost limitless array of types and colors. Many of them are in their prime in May and June when there can be dull moments in a flower garden. In mid-June, the front edge of one of his borders is planted with pinks, both the low perennial dianthus with exquisitely fragrant flowers and attractive mounded grey foliage, and the annual *Dianthus* 'Snowflake.' Behind is the blatant yellow oxeye *(Heliopsis helianthoides),* which last summer bloomed from June to late August. It is a bold workhorse of a plant, satisfying and unfussy, needs no staking and is dependable year after year. Tickseed *(Coreopsis lanceolata)* and blanket flower *(Gaillardia* x *grandiflora* Monarch strain) are the other yellows in the border. Note the chunky clumps of midnight purple clustered bellflower *(Campanula glomerata)* setting off a mass of salmon sweet william *(Dianthus barbatus,* a biennial). The bed is completed by a grouping of tall, handsome blue bugloss *(Anchusa azurea),* which is treated as a biennial in the Thouron garden. This border is marvelous to behold.

In planting pockets in flagstone steps, Sir John finds homes for some diminutive perennials that require good drainage. Here, appropriately, are tiny pinks *(Dianthus sp.),* iris *(Iris cristata),* the foliage of a dwarf columbine *(Aquilegia sp.),* a grey-foliaged, blue-flowered veronica, a miniature lavender, a little hypericum, and, if I remember correctly, some dainty sedums. Framing these steps, in the shade of a stone wall and large old tree, is the great solomon's-seal *(Polygonatum commutatum).* It arches out from the wall, beckoning us toward the garden entrance to the house. What a lovely touch. And when the solomon's-seal begins to look disenchanted (as is its nature toward the end of the summer), Sir John redirects our attention by underplanting it with a vivid orange New Guinea impatiens. The polygonatum is featured for its moment of glory, then the spotlight focuses elsewhere in the garden. Sir John must know the character and timing of each plant to plan for such changes, as we must all.

William H. Frederick's garden

Another garden, very different from Sir John's in site and appearance, but achieving an equally fascinating richness by combining perennials with other types of garden plants, is that of William H. Frederick, Jr., a few miles away in northern Delaware. Traditional flower borders are of little importance in the Frederick garden where the basic design seems more closely allied to the flowing spaces of a modern house than

continued

photos supplied by author

Above, Sir John Thouron's stable border

Above right, Thouron's garden steps

At right, *Lobelia carindalis* in William H. Frederick's garden

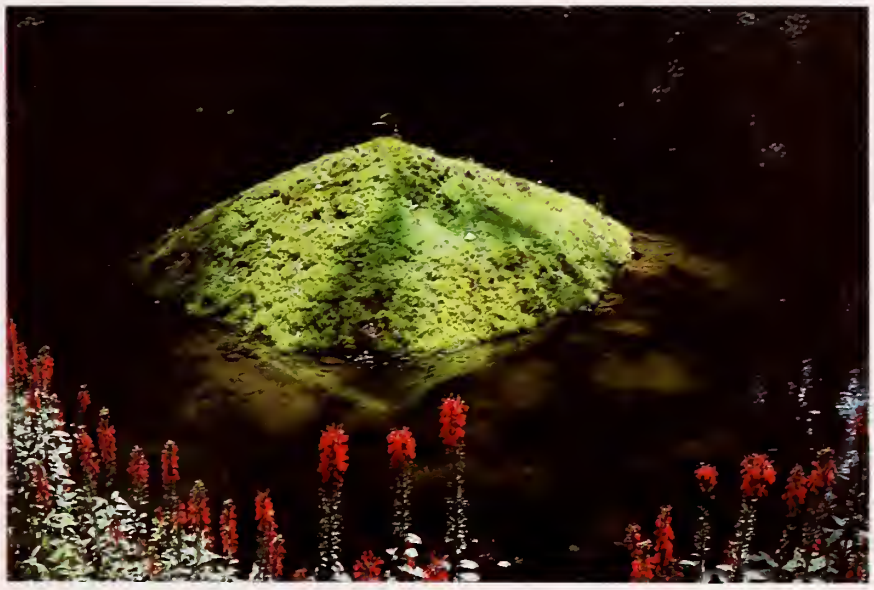

photo by Longwood Gardens

Idea Garden at Longwood. Left foreground — orange flowers, *Helenium* x 'Goldlackzwerg.' Behind helenium — tall, light blue-grey *Clematis heracleifolia davidiana.* On right — large, bright yellow *Helenium* x 'Butterpat' with lavender *Aster amellus* in front of it. Mid-center — strong pink *Phlox paniculata* 'Spitfire' with pale yellow *Gaillardia* x *grandiflora* 'Sun God' beside it. In far distance — yellow-orange *Rudbeckia fulgida sullivantii* 'Goldsturm,' bright yellow, rebloom *Oenothera fruticosa,* tall, feathery, white *Artemisia lactiflora,* and pale magenta *Lythrum salicaria* 'Rose Queen.'

Bluets planted between flagstone paving slabs at William H. Frederick's garden.

to the formal arrangement of a large country place. Here are interlocking garden "rooms" leading one into another with surprises around corners or at the end of a flight of garden steps.

Concern with low maintenance has been a factor in the plant choices made by Bill Frederick. Large areas of contoured garden are covered with perennial ground covers which, when established, have proven themselves not only attractive but largely self-sufficient. Frederick has planted liriope *(L. muscari* and cv. 'Munroe White') and japanese painted fern *(Athyrium goeringianum* 'Pictum') in the partial shade of large old beech trees. *Sedum kamtschaticum* covers a sunny berm planted with umbrella pines *(Sciadopitys verticillata),* and tiny quaker ladies or bluets *(Hedyotis caerulea)* fill the spaces between huge flagstone paving slabs. Perennial grasses are used as sculptural forms in paving pockets surrounding the swimming pool.

Perhaps most wondrous of all is the cardinal flower *(Lobelia cardinalis)* which, having once been introduced, now seeds itself freely in the ivy covering the banks of a shady sunken pond. The choice of this particular plant for this particular site is brilliant. The luminous red of the lobelia against the olive green water and the mossy island is inspired. The same could be said of the bluets between the flagstone slabs. When these delicate flowers bloom, the heavy stone slabs seem to float on clouds. Sensational!

Nice also is the japanese painted fern in combination with the silver trunks of beeches, the deep green of the liriope against the tan of the house, the yellow of black-eyed susans *(Rudbeckia fulgida sullivantii* 'Goldsturm') against the stone of the spring house and on and on. Perennials contribute so much to the thrill of this garden.

gardeners are not familiar with perennials

Perennials probably have been neglected in recent years **not** because they are high maintenance plants (often an unjust criticism), or that they have a short blooming life (some bloom for months), or that they're expensive (which they're usually not) or for any other reason except that most gardeners simply are unfamiliar with the individual plants.

Sir John Thouron and Bill Frederick have familiarized themselves with perennials by traveling around to look at gardens here and abroad and by bringing home, whenever possible, bits or seed of plants that appealed to them. They nurture, watch, and evaluate the finds and then, if a plant proves itself

Perennials probably have been neglected in recent years *not* because they are high maintenance plants (often an unjust criticism), or that they have a short blooming life (some bloom for months), or that they're expensive (which they're usually not) or for any other reason except that most gardeners simply are unfamiliar with the individual plants.

worthy, it goes into the garden scheme. That is probably the best and most thorough way to learn.

There are other ways, however. Books are excellent references and places to start your study. But books are limited since you can't see firsthand what the printed word describes so vividly but so inadequately.

Another alternative is to come learn at Longwood Gardens. The "Idea Garden," now under development, grows many sunloving herbaceous perennials (also roses, vegetables, herbs, and annuals) in rows, allowing interested gardeners to compare plants for themselves. It's an area for study through observation where plants are growing and blooming under conditions typical for the Delaware Valley.

Needless to say, one trip in the spring won't teach you all you need to know about these 200 perennials. Once a week from March through October would be more realistic. And be sure to bring a note pad.

Each spring for the past four or five years, I've listed, row by row, all the perennials in Longwood's plots. I then look at each plant weekly and note on the list a number or symbol from my Key to the Condition of Plants (see box).

After a full season of week-by-week evaluation, I know quite a bit about quite a few plants. Having stared at their labels for at least 30 weeks, I'm a lot closer to knowing their scientific names. I also know which ones come up late in the spring and which ones disappear early. And, most important, my written records shore up my memory.

If you know these things you can begin to work out wonderful color sequences or choose the perfect plant for the perfect spot in your garden.

Skill with perennials can lead to some of the most challenging and rewarding artistic and horticultural opportunities available to Delaware Valley gardeners.

Key to the Condition of Plants

1	=	excellent condition of flower and foliage
2	=	good condition of flower and foliage
3	=	fair condition of flower and foliage
4	=	poor condition of flower and foliage
5	=	dead and cannot be evaluated
6	=	good foliage but no bloom
7	=	poor foliage and no bloom
8	=	good flower but poor foliage
9	=	good foliage but poor flower
10	=	cutback after bloom
11	=	rebloom
12	=	too young to evaluate
*	=	valuable for foliage effect
•	=	photograph taken
b	=	in bud

Flower color, the plant's height at maturity, and pertinent weather conditions are also noted.

Plants from the Three Gardens

BOTANICAL NAME	COMMON NAME
Anchusa azurea	blue bugloss
Aquilegia sp.	dwarf columbine
Athyrium goeringianum 'Pictum'	japanese painted fern
Campanula glomerata	clustered bellflower
Coreopsis lanceolata	tickseed
Dianthus barbatus	salmon sweet william
Dianthus 'Snowflake'	—
Dianthus sp.	pink
Gaillardia x *grandiflora* Monarch strain	blanket flower
Hedyotis caerulea	quaker ladies or bluets
Heliopsis helianthoides	yellow oxeye
Iris cristata	iris
Liriope muscari and 'Munroe White'	liriope
Lobelia cardinalis	cardinal flower
Polygonatum commutatum	great solomon's-seal
Rudbeckia fulgida sullivantii 'Goldsturm'	black-eyed susan
Sciadopitys verticillata	umbrella pines
Sedum kamtschaticum	—

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Landon Scarlett received her M.A. in Art History from Columbia University. Her horticultural education began at Bluemount (perennial) Nurseries in Monkton, Maryland, and at Hillier and Sons Nurseries in Winchester, England. She has been display coordinator at Longwood Gardens since 1973.

Irises and Herbs: Pleasing

by Barbara Bruno

The idea of combining herbs with my irises occurred to me when I felt the need for plants of strong architectural shape to complement the soft, billowing herbs that dominate my garden. Irises were a natural choice with their bold foliage, upright bloom spikes and large, commanding flowers, but I hesitated. I felt as Louise Beebe Wilder felt: "As spectacles they are astonishing; as garden flowers they are a little overpowering." That view changed as I began to discover appealing, elderly sorts in my search for old plant varieties.

Often, among the treasured cuttings and seedlings gathered during a visit to an old garden, would be a rhizome of some long forgotten (and often scorned) iris. These charming old dears with their small blooms spaced along supple stems retain a light, graceful quality lacking in many of the large flowered, modern varieties. They make fine, close masses of color, and their pale honeys, violets and mauves, sometimes netted and washed with the russet of Victorian taffeta, blend nicely with herbs and silver leaved perennials.

Many of the herbs that are such pleasing partners with soft colored, old varieties of iris would serve as well when planted with strong hued, modern kinds. Some are common plants but perhaps not thought of for this use. Others are a bit more unusual, but all are easily grown and most rewarding.

The first iris to color my garden is the slender, slim-milk white Florentine iris, *I. germanica florentina*. Its rhizome

Above, a grand companion for iris, showy meadow sage in pinks and purples. Artemisia 'Silver King' in right foreground

At left, garden at iris time

To right, yellow iris and white dianthus joined by the spring green of burnet and sedum

Partners

is the orris root used as a fixative in potpourri and the oldest variety grown here. Its early, free blooming ways made it a valuable addition to the garden. Some authors describe it as dingy, but surrounded by the tender greens of spring foliage with a carpet of fresh bright pink armeria, *A. maritima,* and the violet wands of meadow sage, *Salvia pratensis,* for companions it prompts many admiring comments.

Iris rhizomes need good air circulation so are best placed near the front

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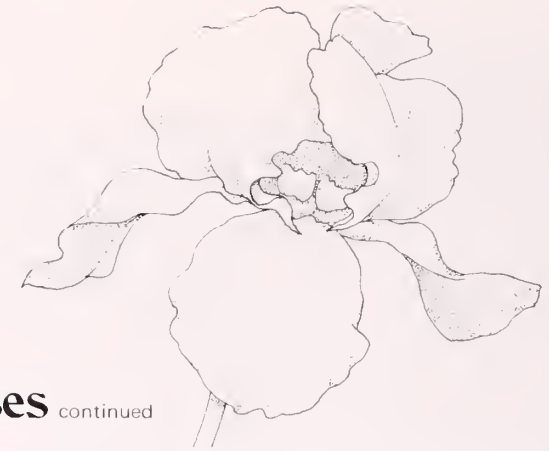

Irises continued

of the flower bed. I like to leave enough space to tuck in low growing plants to soften the border's edge. All of the carpeting thymes are well suited to this purpose if you take care to keep their wandering stems from entering the iris clump. Wooly stemmed thyme, *T. thracicus,* blooms at just the right moment, covering itself in tiny, pale pink blossoms, which are especially pleasing with clear blue iris. My favorite thyme to grow with iris is golden thyme, a chartreuse leaved variety of *T. vulgaris.* It is just the right accent with purple iris and cornflowers. In another grouping it joins raspberry pink painted daisies and pale pink iris.

Any of the mat forming pinks make excellent iris companions, but be sure to allow room for the pinks to spread without smothering sun-loving iris rhizomes. *Dianthus fragrans,* a delicate, white single of fine fragrance, looks especially lovely when grown with a bright, butter yellow iris.

Two members of the sage family go especially well with iris. The blossoms of meadow sage, *Salvia pratensis,* vary from a strong violet-purple to pale pink. The flat rosettes of pebbly, dull green leaves should be placed near the front of the border where the numerous racemes of two-lipped flowers make quite a show. Flowering starts at the bottom of unequal spikes giving an impression of a cloud of bloom rather than vertically aligned color. Seeding is prolific, and I watch for interesting color variations. The prettiest to date has been a pink bicolor sporting a bright raspberry bottom lip.

Common sage, *Salvia officinalis,* with its loose tumble of lavender-blue bloom above pebbly, grey-green leaves complements most iris hues, whether vibrant or muted. A particularly pleasing combination was a burnt orange iris with lavender-blue sage and the frosty silver of fringed *Artemisia versicolor.* A few self-sown johnny-jump-ups *(Viola spp.)* added just the right touch.

In a bed isolated from the main planting this same burnt orange iris is the focal point of another pleasant grouping. Backed by the tall, deep burgundy leaves of fringed loosestrife *(Lysimachia ciliata),* it shares a small corner with amethyst *Aquilegia vulgaris,* the chubby columbine of English cottage gardens and Shakespeare. Furry silver mats of lamb's ears *(Stachys byzantina)* and a few precocious seedlings of an old, floppy, white variety of sweet alyssum complete the picture for now. Soon the delicate leaved old rose 'Harison's Yellow' will frame the grouping in garlands of small golden bloom.

ideal companions

Several members of the mustard family are ideal companions for iris, forming a backdrop of color against which the irises can be viewed. Woad, *Isatis tinctoria,* with blue-green leaves and mist of bright yellow flowers is spring personified. It is effective over a long season through several stages of growth. In early spring its chartreuse panicles of buds give the effect of bloom long before the cloud of hundreds of tiny, sulphur yellow flowers expand. Almost any color iris is enhanced when viewed against this sunny haze of color. Especially happy combinations have been orange iris with lavender sage and woad; creamy, pale yellow iris and a dusty pink form of chives.

After bloom unusual, flat, tear shaped seedpods continue the show, remaining attractive over a lengthy color change ending in a shiny jet brown. After this bountiful show the plant often dies, but we need not worry because a plentiful supply of seedlings always replaces spent plants. Young plants on fresh soil always bloom best, anyway.

Sow a few seeds of the fragrant sweet rocket, *Hesperis matronalis,* behind an iris clump in spring to add a graceful dusting of background color at iris time the following year. The plant's tall, narrow habit of growth, spreading at the top into long fingers tipped in bloom, make it ideal for interplanting among late rising perennials. The white form is the most useful, but I like the bright orchid pink. It both enhances the subtle coloring of a cinnamon netted, fawn and mauve pink iris and enriches the lush burgundy-plum of a velvety textured beauty.

Honesty *(Lunaria annua)* is another biennial mustard that can be put to the same use as sweet rocket. A stiff growth habit with bloom at closer intervals offers a more concentrated color effect than the later plant. It is available in a showy pink or white, and after flowering the seedpods, flat circles of pale green, add interest for several more weeks.

Painted daisy *(Chrysanthemum coccineum)* is a fine plant to grow with iris. Its simple shape contrasts nicely with the complex iris form, and the color choice from bright cerise through pink offers a hue for any grouping. I grow several in shades varying from soft to lively mid-pink. The palest accompanies 'Tom Tit,' a small, delicate, dark purple iris. A stronger pink complements a pastel pink iris with brilliant orange beard called the "peach ice-cream flower" by my young niece.

a bare spot

If you are faced with a bare spot near your iris or have a bit of room next to a slow growing perennial, sow a few bachelor's buttons *(Centaurea cyanus)* for spring bloom. Choose the old-fashioned tall growing, blue ones; they are much more graceful than the newer, compact ones. Put the color up near the iris blooms where it looks best. Even a few scattered flowers of this lovely, intense blue enhances

Early iris with woad, candytuft and blue, creeping veronica

almost any color iris. I grow them with the lavender Iris 'Blue Suprise.' The surprise of this old variety is a mouth watering scent of grape soda.

All of the plants mentioned so far bloom at iris time in late May, but don't overlook the fresh spring foliage of late bloomers to enhance your iris picture. Silver leaved plants also make flattering companions for most iris, while burgundy or blue-green foliage contrast strikingly in the right setting.

a garden for every season

Since my one garden must serve for every season I try to achieve a feeling of bountiful bloom when only part of the garden is in flower by separating plants of bold growth and hue having the same season of color. Plants of lesser stature and bloom are arranged to lead the eye from one grouping to another. Two herbal main courses of the iris season that are treated in this way are foxgloves *(Digitalis purpurea)* and dittany *(Dictamnus albus).*

I try to have at least one grand clump of foxgloves in the garden each spring. When positioning it I keep in mind that its bloom season will span two garden peaks, iris time and the beginning of old rose season. I prefer to grow a single color selection at a time. For the past few years it has been the variety alba whose bold, white exclamation points contrast well with both rainbow hued iris and the myriad pinks of cascading roses.

Although it takes several years for dittany, *Dictamnus albus,* to become established it is well worth the wait. By its third spring the much branched clump of attractively pointed, pinnate leaves will be topped by generous racemes of elegant pink or white flowers. In this case, the pink is the more beautiful, the inside of the pale blooms being intricately penciled in stripes of a darker coloring. A cloud of 10 delicately curved stamens further enhances each flower. After bloom, five part, woody seedpods and mounds of dark green foliage remain handsome into fall.

This list is far from complete, and your own favorites may not have been named. When planting iris keep in mind the many pleasing partners that add so much to the May garden picture.

COMPANIONS FOR THE IRIS GARDEN

BOTANICAL NAME	COMMON NAME
Aquilegia vulgaris	—
Armeria maritima	pink armeria
Artemisia versicolor	—
Centaurea cyanus	bachelor's buttons
Chrysanthemum coccineum	painted daisy
Dianthus fragrans	—
Dictamnus albus	dittany
Digitalis purpurea	foxgloves
Hesperis matronalis	sweet rocket
Isatis tinctoria	woad
Lunaria annua	honesty
Lysimachia ciliata	fringed loosestrife
Salvia officinalis	common sage
Salvia pratensis	meadow sage
Stachys byzantina	lamb's ears
Thymus thracicus	wooly stemmed thyme
Thymus vulgaris	golden thyme
Viola spp.	johnny-jump-ups

●

Barbara Bruno is a gardener with a special interest in collecting and preserving varieties of old roses and herbaceous perennials no longer offered by nurseries.

the influence of the orient on color

by Ann E. McPhail

Arranging plant material for color and texture is a matter of personal taste. It is a subject not easily taught nor easily described. For example, over the years, in talking with people about their gardens, I have been interested to note how many people have rather vague feelings about trees and shrubs that droop or weep or are contorted or controlled in some way or have yellow, silver, blue-gray or variegated foliage. (See "Gray is a Virtue in the Garden" by Barbara Bruno, *Green Scene,* January 1979.)

An important design point of Chinese origin incorporated extensively today is having the garden as an extension of the house.

Section of McPhail herb garden. Partial list of herbs: *Santolina chamaecyparissus, Thymus spp., Allium schoenoprasum* (chives), *Lavandula spp., Rosmarinus spp.* (upper left), *Artemisia abrotanum* (upper right), *Satureja spp.* (savory — far right)

Form, texture and variations of color achieved through foliage plants have been the mainstay of the eastern oriental garden for centuries. The West owes much to the East for its landscape design and especially plant material. Here in the Delaware Valley, introductions of plants from the Orient comprise a substantial part of the rich assortment available to us. Before I discuss those available here in the Delaware Valley, I'd like to explore briefly some of the historic developments in garden design and plant introduction that have become an accepted part of our lifestyle in the 20th century.

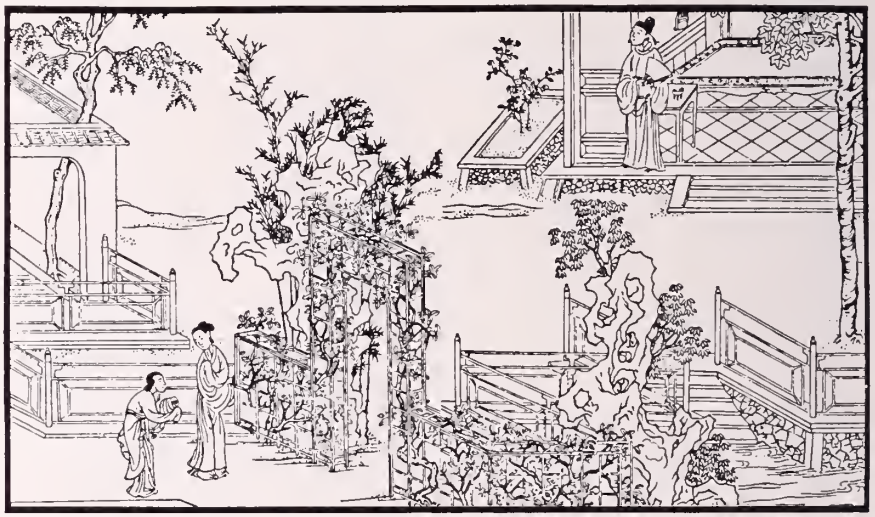

Illustration from *The Romance of the Western Chamber,* a Chinese play written and re-written from 800 A.D. on.

our debt to the east

From the Near East, Egypt and Iran come the designs for enclosed parks, gardens, paved areas and the imaginative use of water; from the Eastern Orient, asymmetry, meandering walkways and a high percentage of the introduced plant material. The great plant explorer, Ernest Wilson, wrote in the introduction to his book, *China, Mother of Gardens* (The Stratford Co., Boston, 1929): "It is safe to say that there is no garden in this country or in Europe that is without its Chinese representatives and these rank among the finest of the tree, shrub, herb and vine." Introduction of Chinese plant material into Europe began after the Portugese reached China in 1516 and brought back the sweet orange of *Citrus sinensis.* With the formation of the English and Dutch East India Companies, respectively, in 1600 and 1602, a regular traffic in the more useful and beautiful plants cultivated in China was maintained. Later, plant collectors explored the length and breadth of that vast country, culminating with the mid-19th century "Renaissance Man," Robert Fortune, who sent back 190 species of ornamentals.

A welcome addition to the monumental reference, *Gardens of China* by Osvald Sirén, written in 1949, is a very

& texture in delaware valley gardens

The Imperial Garden at Shugaku-in. In congested Japan an illusion of space created by careful design.

new book entitled *The Chinese Garden* by Maggie Keswick (Rizzoli, 1978). Keswick relates that the first description of a Chinese garden to appear in the West was published in Paris in 1749, in a letter from Pere Attiret, one of several Jesuits whom the Ch'ien Lung Emperor employed as painters to his court in Peking. What he wrote to his friends undoubtedly puzzled them. His descriptions of private gardens referred to asymmetical plantings (unheard of in Europe in the 18th century), trees and shrubs growing in seemingly unrelated or spontaneous groupings, streams wandering through the gardens creating ponds here and there, bordered by plantings of every description and fantastic rock formations and connected by meandering pathways. This very personal and seemingly informal design contrasted with the symmetrical layout of the capital buildings in Peking. An important design point of Chinese origin incorporated extensively today is having the garden as an extension of the house. But what was included in the Chinese garden (some of the more famous ones were created by artists) were favorite places such as mountain retreats, lakes, waterfalls and forests, all executed in what might be described as mini-impressions. Thus, for the creator of the garden, every turn in the path was an emotional experience. Chinese gardens were normally designed to be lived in and used in a variety of ways. Although many of us would find the more esoteric designs in Chinese gardens not to our taste, the overall concept fits in very well with today's eclectic architectural styles that invariably offer easy access to the garden as well as year-round viewing.

Perhaps no other country has developed the evergreen viewing garden to the extent that the Japanese have. Although Japan owes much of its cultural development to China, its people developed and changed many of the original Chinese concepts for their own purposes. Overpopulation has long been a serious problem on these mountainous islands and today they need precious living space—almost 114 million people are crowded into a space less than twice the size of Texas. For the Japanese, a roof-top bonsai collection or a tiny illusion or viewing garden is all the space that is available. The grounds of temples, shrines and Imperial domains make up the bulk of the larger and more complex gardens in Japan. One of the most famous and perhaps the most influential in the realm of use of texture and illusion is the Imperial garden located near the village of Shugaku-in outside Kyoto. Once the country retreat of Emperor Gomizunoö, it was completed in 1655 and still covers some 75 acres terracing the side of a heavily wooded mountain in three levels. On the upper level of the gardens is a pavilion appropriately

continued

titled the Cloud Touching Arbor. Viewed from below at the foot of a small lake, the pavilion nestles into a fantastic landscape of controlled texture and color. Included are great sections of sheared trees that are maintained by gardeners who prune them by creeping underneath and then standing up and shearing all they can reach and then move on. These sheared areas provide needed changes in levels for viewing the lake from the pavilion as well as the textural planes that they provide. Among the lengthy list of plant material used are azaleas, camellias, *Cornus kousa, Chamaecyparis spp.* and *Cryptomeria spp.* The concept of the design is a miniature landscape conceived on a grand scale. It has long served as the prototype for more contemporary Japanese gardens and public plantings. I feel that there is much to be learned from these people, who are already living in a congested country and who have developed phenomenal spatial effects and illusionary methods in their garden designs. An attractive and interesting book on the development of the Japanese garden is Loraine Kuck's *The World of the Japanese Garden, From Chinese Origins to Modern Landscape Art* (Weatherhill, 1968).

Robert Fortune toured Japan as well as China in 1860 and in his recounting of his journey in *Yedo and Peking, A Narrative of a Journey to the Capitals of Japan and China* (Murray, London, 1863) he visited the great naturalist and plant collector Von Siebold who was living near Nagasaki. Around his residence he maintained several nurseries for the reception and propagation of new plants and prepared them for transportation to Europe. Nearly 50 years passed before additional plant exploration was done by Ernest Wilson and it was another 50 years before the U.S. Department of Agriculture, in conjunction with Longwood Gardens, made a series of collecting expeditions in the 1950's to investigate wild and cultivated ornamentals suitable for introduction into the United States.

The plant material derived from these collecting expeditions are now to be found all over the United States. Having developed the preceding historical review concerning the introduction of plant material and garden design primarily from Chinese and Japanese references, an ideal or composite garden emerges containing the most attractive points of both styles. The Chinese style of walls, informality, potted plants and the element of surprise works well with the Japanese expertise in the use of color and textural evergreens, unique pruning methods and spatial effects. These gardening concepts continued to be used in both countries today and are just as valid as they were 400 or more years ago.

selecting and using some of the interesting plant introductions

Often the inspiration for selecting the varieties of plants for a private garden depends on observations made in the garden of a friend, parks, arboretums and commercial nurseries. Except for the friend's garden, the basic problem with this idea is that rarely do the other three have sample plantings and groupings of trees and shrubs for a private residence. The parks are often too grandiose and commercially planted. Although the arboretums do offer information, lectures and courses and usually have groupings of particular species, quite often much of the plant material in the arboretum dates back to its founding or has such exotic background that it cannot be found in nurseries. Even in the larger nurseries that offer a tremendous range within most species, there are no areas set aside to demonstrate interesting and practical use of plant material.

The almost mind-boggling displays at the larger nurseries usually dismay the fledgling gardener. On the other

You can experiment with color and texture using these displays at Waterloo Gardens in Devon.

hand, these same displays offer the more experienced gardener a wonderful chance to browse and find something of interest in color, texture, size and form. (An example of such a nursery is Waterloo Gardens located in Exton and in Devon, Pa.)

Take time to read the labels when making selections. A label should give you the basic information for growth in this area: height and width, slow or fast growing, exposure—sun or shade, hardiness, and soil conditions. Question the horticulturists who are usually employed by the larger nurseries because they are there to assist you. Take along a picture of the area where the plantings will go; know its relationship to the main residence and also the general size of the area under consideration. Try out a few color and texture schemes at the nursery (I would suggest doing that at an off-peak time like early in the morning). Plan to take time to change the containers around until you feel comfortable with the arrangement. For example, the quickly arranged grouping in the photo on page 20 could easily have been extended out to the left by introducing the additional texture of a dark green ilex. That in turn would balance off the *Pinus mugo* diagonally to the right. Many dwarf and semi-dwarf hollies are available. Perhaps another type of conifer could be substituted for the *Pinus cembra* although it is a much recommended, slow-growing type of pine. ("Uncommon Conifers for Area Gardens" by Thompson V. Palmer, *Green Scene,* September 1977.)

After you have finally arrived at a decision and purchased your plants and returned home full of enthusiasm expecting a gorgeous new garden, take time to work out the proper spacing when placing the plants in the bed. Remember that the dwarf varieties do crawl around, make mounds of foliage and eventually use up the space around them. A trip to the Barnes Foundation Arboretum to observe their area plantings of dwarf and semi-dwarf plant material could prove useful. If a tree of any size is incorporated into the plan, space must be included for its eventual spread even though you plan to prune it periodically. Many of the low ornamentals will not produce their color variations if shaded or without proper amounts of sunlight. (If you have problems with spacing, read "Space" by Ed Lindemann, PHS staff horticulturist, *Green Scene,* March 1976.)

After you've planted this marvelous, asymmetrical, flowing garden full of color and texture, you can do what Ralph Snodsmith (WOR Radio-New York horticultural wizard) says, "Stand back and watch it grow!" Fortunately, many of these oriental species are rather slow growing; however, I would suggest reading "Pruning for Beauty" by Frederic Ballard *(Green Scene,* July, 1973).

Assembling a planting of this type is a challenge that takes time, work and patience. But in this world of machine-made everything, it is fulfilling to create something that is one-of-a-kind, something that is personal and an expression of yourself. Space is becoming a premium in many areas and hence more expensive. So much can be done in a small area with the color and texture provided by these gems from the Orient.

All books listed in article are available in the PHS library.

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Ann McPhail has traveled to the Orient several times to observe their culture and their interpretations of gardens. For many years, she has been associated with the Philadelphia Museum of Art as a guide-lecturer, where she has organized seminars, written monographs and slide talks and has done research for educational exhibits in the oriental section of the Museum. She is an artist and for 15 years has studied the techniques of Chinese brush painting.

Diagram of sample grouping. List of plant materials:
A. *Pinus cembra*
B. *Juniperus conferta* 'Blue Pacific'
C. *Juniperus squamata* 'Blue Star'
D. *Juniperus chinensis procumbens* 'Nana'
E. *Pinus mugo*

Section of McPhail garden illustrating a mature planting of textural material. Partial list of plant material: *Hosta albomarginata, Paeonia albiflora* (single pink), *Juniperus procumbens, Ilex cornuta* 'Burfordii' *Oenothera fruticosa* (blooming — foreground)

Foreground (white) *Pachysandra procumbens;* background (purple) *Mertensia virginica*

Look for the Native Pachysandra Blooms in April

by Elizabeth B. Derbyshire

The native pachysandra can be described as a plant of the spring woods, displaying an attractive creamy white, fragrant spike of flowers in early April. André Michaux, the French botanist, named it *Pachysandra procumbens** after seeing it on his travels through the southeastern states during the last part of the eighteenth century. It's known here as Alleghany pachysandra or mountain spurge.

Although it is of the same genus as our Japanese pachysandra, its growth habit and cultural requirements are quite different. The native pachysandra could be classified as a ground cover, although certainly not as rampant a spreader as its Japanese counterpart. The clumps are about 10-12 in. tall. The foliage is only semi-evergreen and dies down by January depending on its exposure and the amount of snow and ice. The coarsely toothed 1½ in.-3 in. elliptical leaves appear to be whorled but closer examination shows them to be alternately arranged. The creamy flowers, sometimes tinged with pale pink, appear on a 10 in. spike in April and are more conspicuous than the Japanese species. They are larger and, with the leaves not too evident, make a prominent display in the spring blooming landscape. After flowering, new leaves appear in May and unfold a soft grey green color with a peppering of white spots on the upper surface. In the fall, some of the leaves change to a soft bronze color.

This hardy herbaceous perennial does well in partial shade and can be used effectively under small deciduous and evergreen trees, as well as in the perennial border. It does respond to a humusy soil from the woods, with good drainage, although it appears to be a plant that adapts well to various situations. I have seen it growing well at the Morris Arboretum in the John Morris rockery in company with the other species of pachysandra. At Skylands, a half hour northwest of Paterson, New Jersey, it has been used as a ground cover under the wafer-ash, *Ptelea trifoliata*. Here the plants have been clumped close together as a ground cover to furnish a solid massed effect.

My own plantings originated from the Delaware Valley Rock Garden Society plant sale. From mid-July through September, I have put 3-4 in. cuttings in a flat with 2/3 sand and 1/3 peat moss covered with plastic and placed in a shady location. The ones propagated in July were potted up in September and kept in a coldframe until spring. The later ones were left in the flat for spring transplanting. Tom Buchter, associate director of the Henry Foundation for Botanical Research, recommends including 2-3 basal buds in the length of the cutting to insure more mature plants in a shorter period of time.

Combining Alleghany pachysandra with the early crocuses, scillas, and native columbine *(Aquilegia canadensis)* creates an attractive effect in a corner of the shady garden.

Although to my knowledge Alleghany pachysandra is not classified as an endangered species, it is not a common native plant. I highly recommend that we make it more of a permanent part of shady gardens in the Philadelphia area where it is hardy, according to Alfred Rehder. It behooves all of us to reestablish in our gardens some of these vanishing species so that future generations can enjoy some of the descendants of the plants discovered by John and William Bartram, Mark Catesby, and André and François Michaux.

●

Betty Derbyshire lives in a woodland setting near Green Lane, Pa. She continues to landscape with native material and develop a wildlife sanctuary on the property.

*Pachy from the Greek "thick stem"; procumbens meaning trailing.

MICROCLIMATES

by Lee M. Raden

Microclimates, what a delightful word. The problem is that most of the books on the subject are of a highly technical nature, written by meteorologists. What are we, the poor amateur, to do?

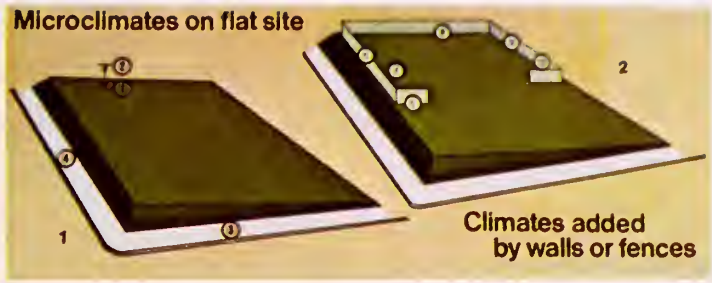
Yet, an understanding of the basic principles of microclimate saves us time and money. Placing plants in the appropriate microclimate (location) around our home and property can bring them to horticultural perfection. Please take a moment, in the frenzy of spring and fall planting, to walk around your property with a compass to give you direction, and an occasional look at the sun and its angle in the morning, at high noon and three in the afternoon. This check will also give you your maximum and minimum shadow locations. In southeastern Pennsylvania we have a climate that, according to the charts, is the same as northern Virginia. All of us know that is not necessarily true. Certain periods in January and February are often too much like Alaska. Our knowledge of microclimates can lessen the damage of winter sunburn, winter windburn, improper air drainage, and radical freeze-thaw cycles.

Illustration 1 describes, in detail, microclimates available on a flat site and climates added by walls or fences. While all of the points made in the picture are perfectly logical, the addition of your house to the property with its orientation to direction and sun angle defines your microclimate.

Illustration 2 should be studied very thoroughly because in our latitude sun angle is probably the most important factor to consider in the planting of ericaceous material. In viewing this picture for the first time, please also consider windbreaks. On either new or old sites the building of a "berm," also called a mound or a hummock, is probably the most inexpensive way to accomplish two things: first, an interesting garden area with soil made to your exact specifications as to the correct amount of soil, sand, clay and any other soil conditioners you find you need to fulfill your plants' require-

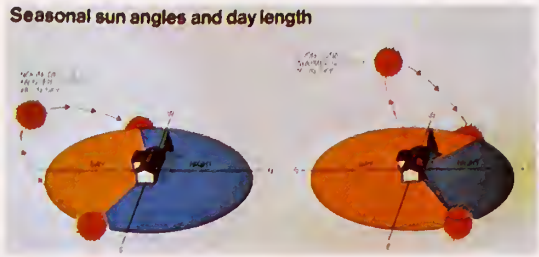
continued

1



1. Even a vacant lot has more than one climate. Temperatures differ at its surface, and spots a few inches or feet above. South slopes absorb most radiation, north slopes the least. **2.** Fences and walls further increase the climates. Solid ones can absorb and radiate heat; ventilated ones allow circulation and are better windbreaks. **3.** The house establishes your most constant solar pattern. The north, almost perpetually shaded, is a location for hardy, cold-resistant plants. Tender varieties find the full sun of the south wall more suitable. East and west walls receive equal sunlight, but the latter is warmer because some of the morning sun energy is used to overcome the cold of the preceding night. **4.** Ground treatment varies the microclimates in warmer or cooler directions. Paving, gravel, soil, grass, and other covers all have different radiating and reflective properties. Secondary structures are immediate climate controls.

2



- Structural or plant "ceilings" to reflect back outgoing radiation at night
- Sun pockets
- Windbreaks and cold airflow diverters
- Mulches

To make it cooler:

- Shade trees and vines
- Overhangs, awnings, canopies (cooler in daytime, warmer at night)
- Planted ground covers
- Pruning of lower growth for increased air circulation
- Evaporative cooling (from sprinklers and pools)

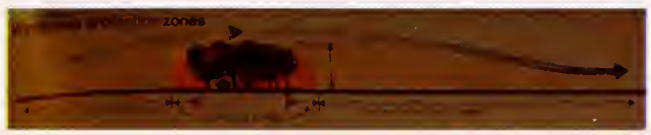
To make it less windy:

- Windbreaks, baffles, diverters (planted and structural)
- Berms
- Semi-enclosed outdoor living areas

To make it breezier:

- Pruning of low branches of trees
- Minimum low plant growth
- Creation of breezeways (structural and planted)

3



The zone of windbreak protection is governed by its size, extending to its leeward from 25 to 35 times its height. The degree of protection diminishes with the distance from the barrier.

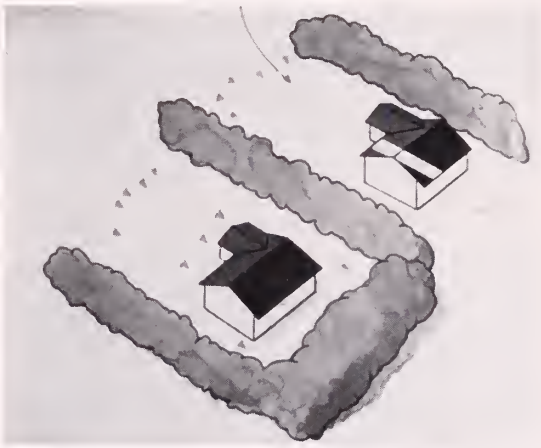
The windward side is affected as well, with wind speed reduced in a zone 5 to 8 times the height. A narrow band of dead air is immediately in front of the windbreak.

Slopes modify the length of the protected zones, decreasing them on the windward side and extending them on the other.

4

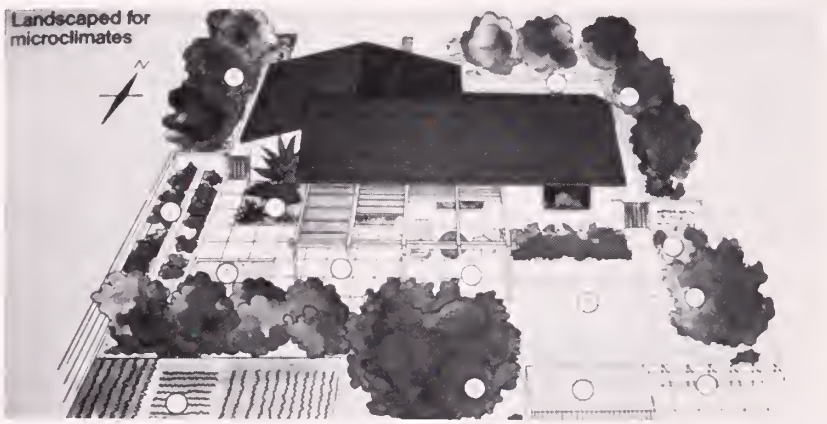
The paths of cold air are easy to predict when you think of it as a liquid. It will follow any natural watershed to its lowest level, where it settles in a pool. When a depression is filled, the air overflows and continues to the next one. The flow increases as the ground continues to lose heat, ceasing only when the morning sun begins a new radiation cycle.

5



Plants edging the path of a breeze help move it a little faster, again, the Venturi effect. Don't block its channel at the other end of the property with a wall of plants, though; let pass clean through without an impediment.

6



1. & **2.** Controlled shade zones (**1.** is warmer, receives afternoon sun); **3.** Sun pocket—receiving noon and afternoon sun; **4.** Pond—good place for shade and moisture-loving plants; **5.** Morning and mid-day sun zone—wall provides some protection; **6.** Full shade zone; **7.** Morning sun zone; **8.** Full shade zone—trees and house provide protection; **9.** Partial sun zone for late afternoon radiation; **10.** Variable shade zone below a tree; **11.** Full sun zone; **12.** Controlled shade zone provided by lath house; **13.** Greenhouse—absolute climate control; **14.** Variable shade zone below a tree; and **15.** Full sun zone for vegetables and other sun-loving plants.

ments for cultural perfection; second, it will serve to divert wind from choice plantings on the lea side of the mound, and to be a landscape jewel and windbreak for your house.

Illustration 3. A mound is shown on the bottom of the drawing and while it shows the principle for a hill, the same principle works in miniature for a berm. Trees can also work their magic, which is shown very well in picture 3.

Illustration 4. In southeastern Pennsylvania there is no question that many plants are winter-killed because of a lack of understanding of cold air flow. Cold air flows like a river. Orchardists have known that for years and whether it be apples, plums, pears, or grapes, they are never planted in a valley. This illustration says it much better than words.

I know a woman, who lives in Oregon, who has a fence around her property with two large gates, one at the top of the hill and one at the bottom. In the winter the gates are left open for cold air drainage. Before she installed the gates she had severe frost damage to very choice rhododendrons. She has avoided most frost damage for the last 10 years simply by opening the gates.

Illustration 5 shows the "Pitot effect," or as some people call it the "Venturi effect." The moving air is speeded up by compressing it into a narrow confine. The best example is demonstrated in a large city on a breezy day. You'll find a tremendous increase in velocity of the air as it tries to squeeze between two skyscrapers. We have the same effect in our valley (the Chester Valley). There is always a breeze in the summertime from west to east, and our valley is approximately a half mile wide. This movement of air, especially in the summertime when we are enjoying our "mugs"—temperature 95°, relative humidity 95°—the plants are literally drowning in the humid air. The stomata, that marvelous breathing apparatus on leaves, are drowning in super-saturated moisture. The breeze created by the Venturi effect gives sufficient evaporative cooling to make the difference in life or death of a choice plant.

Wonderful illustration 6 should be your creation after "x" years, establishing all of the factors that create effective microclimates around your home. The placing of recreational, garden and landscaping areas will become apparent in a cooler home in summer, a warmer home in winter, and a horticultural delight to you and your friends.

●

Lee M. Raden continues to experiment with hummock gardening and its attendant microclimates in Chester County, Pa.

ROSE RENAISSANCE: *A Publishing Event*

by Léonie Bell

Anyone who has tried to add out-of-print books to a library lately knows how the price of used copies has skyrocketed. Since Elizabeth Woodburn's last general catalog appeared in 1965, its over 2,000 items representative of the great floras and gardening books of a century, almost every quotation has quadrupled, a reminder of what we might have added to our own modest shelves had we known.

Good used rose books in particular are hard to find. This shortage is because of a phenomenal increase in interest in the old roses that has risen in inverse proportion to their availability in nurseries. The harder the roses are to come by, the more people seem to want to know about them.

Librarians help, of course, but a borrowed book full of dates, descriptions and history is hardly enough in small pieces of time. And in recent years, older books can no longer be taken out at all because of their fragility. You see, early in the 19th century the technology of making paper from wood pulp swept into the still young publishing industry. Rag stock was replaced by the acid-based "sulphite," and so the term *pulp* entered the language. Unfortunately, the first catalogs of roses, issued in book form, were printed on this inexpensive paper which does not age well. Even their sewn bindings do not hold up with repeated use; rebinding may save the pages but the book can never lie flat again. Still, nothing will do but to find, somehow, a copy of your own in no matter what condition. This has become a very expensive endeavor. Many would-be rose students had about given up the search.

Then something happened. In September 1977, at a country fair in Duchess County, New York, Lily Shohan, chairman of the Old Garden Rose Committee of the American Rose Society, had a display of roses that attracted a new neighbor of hers. Impressed by their beauty, he suggested that a directory of all the roses ever introduced might be a splendid idea. Shohan had to tell him, "It's already been done. *Modern Roses* has come out in seven editions."

Now one can underline or write notes in the margins without fear of defacing some treasure.

"Then, is there anything in the field that *you* would like to see published?"

Thinking to humor the man, the quick-witted Lily reeled off seven or eight titles long out of print; the first, Roy Shepherd's *History of the Rose.*

"I'm a publisher. I'll do them."

He introduced himself as Earl Coleman, former president of the DaCapo Press, a facsimile reproduction house which he had founded in 1963 and under which name over 1500 out-of-print books had been put back into circulation. DaCapo had grown too large; now he wanted to start over and was looking for interesting fields that had been largely ignored. Roses seemed an excellent subject to plumb for reprint possibilities.

Through that fall, Lily and I shared our incredulity. Was this actually happening? What should we ask him to take on? Which books did other old-rosers (as we call ourselves) need most?

By early December a set of six had been settled upon, three from this century, three from the last. Coleman had already secured publishing rights to the Shepherd; he proceeded to get permission where necessary for the rest. We could assure him of a market. Next came the challenging task of finding preface writers to match the six books, preferably people who had great personal enthusiasm for one or another of them.

Here are the titles, and the rose authorities who chose to introduce them:

The History of the Rose. Roy Shepherd; New York, 1954. The only monograph on the genus *Rosa* by an American. Encyclopedic in scope, it will probably never be surpassed. From the beginning, it was Lily's first and only choice. Understandably, it has since proved the most popular.

The Rose Garden. William Paul; London, 1848 (first edition). Our own

continued

Hand-tinted lithograph by James Andrews of the Rose 'Mauget' from the first edition (1848) of *The Rose Garden* by William Paul. Author's copy and photo.

Richard Thomson wanted to do the Paul, his favorite of all the old rose books. His affection for it comes across well. This was the plum of the lot for it was the only one with color plates; these had to be printed three times (by an American press) before they satisfied Coleman.

Old Roses. Ethelyn Emery Keays; New York, 1935. My own mentor had been Mrs. Keays, a graduate of Vassar who spent summers down in Calvert County, Maryland, where she collected the venerable roses of the neighborhood, pinned down their identities through research, then wrote about them. Her vast knowledge and graceful way of sharing it put her on a par with Gertrude Jekyll and Louise Beebe Wilder.

Old Garden Roses. Edward A. Bunyard; London, 1936. It seems strange that even while Mrs. Keays's study was being published over here, a similar book was in the works in England; but in this case, Bunyard supplied the excellent gravure illustrations that we miss in her book. The introduction fell to Beverly Dobson, New York, who is now at work on the eighth edition of *Modern Roses,* the International Registry of Roses.

The Rose Manual. Robert Buist; Philadelphia, 1844. Edith Schurr, Washington, former chair of the O.G.R. Committee, naturally gravitated to the Buist because her grandparents, still in Ohio in the 1850s, had ordered their roses from Robert and later from his son. The extensive nursery was located in South Philadelphia on what is now Buist Avenue.

The Rose Fancier's Manual. Catherine Frances Gore; London, 1838. By default, because it contains over 1400 descriptions that defy quick comprehension, I had to take on this additional title. Being oldest and fattest, its pages were usually in the worst condition, so librarians were loathe to lend their Mrs. Gore. My copy has been held together with rubberbands for many years, studied with a taped sheet of glass to hold down and apart the loose pages. Also, I was particularly eager to clear Mrs. Gore's name since she had from the start been accused of plagiarism. Yet she clearly gives credit (for those who read far enough) to the French botanist M. Boitard who in 1836 published his own *Manuel [sic].*

Not until I visited the great library of the Massachusetts Horticultural Society last year did I realize what an enormous favor she had in fact done us. The original Boitard was no bigger than a wallet, 3 in. by 5 in., the pages so thin that the reverse type showed through, without margins, in a minis-

cule typeface that needed a lens to be read. As Lily Shohan observed, it was not reprintable.

Aside from the wealth of information they contain, the greatest pleasure to be found in these facsimile reprints is their construction: the ivory paper is of excellent quality, the signatures securely sewn by the Smythe technique so that the open books lie flat; gone is all concern that the pages may fall out. Now one can underline or write notes in the margins without fear of defacing some treasure. No longer need the amateur rose sleuth feel that ownership of a rare and expensive rose book is only for the wealthy; as *working* volumes, these are much to be preferred to their originals.

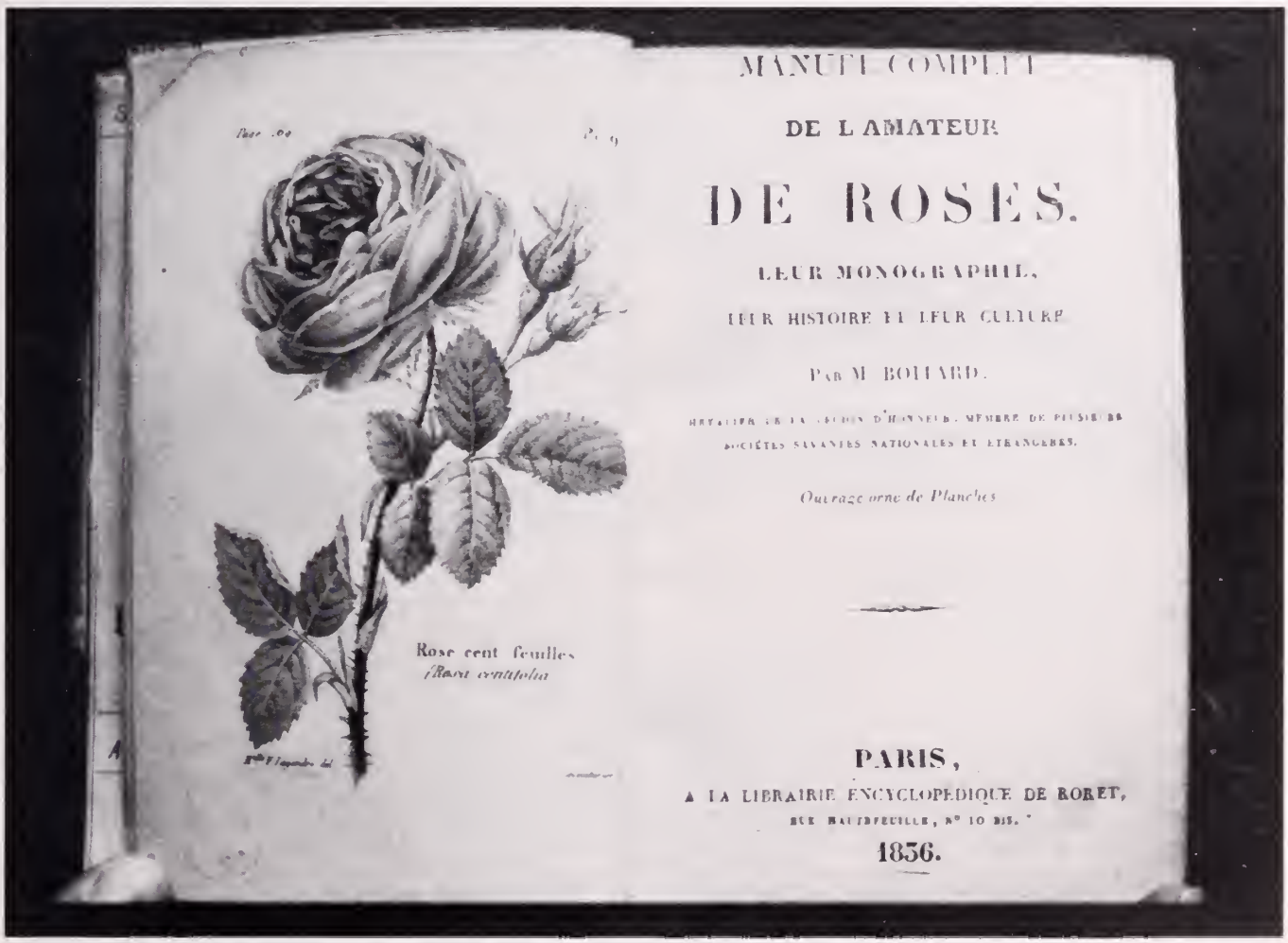
We still find it hard to believe that what in one year had been a hopeless gap was, less than twelve months later, a handsome reality, thanks to a chance encounter of two people at a country fair—and the irresistible lure of the Rose.

The number of those who come under its spell grows annually. In 1975 a group of friends across the country brought out the first quarterly newsletter of what they called the *Heritage Roses Group,* quite separate from the American Rose Society. To date there was more than twelve hundred subscribers. If you wish to join, send three dollars to Lily Shohan, R.D. 1, Clinton Corners, NY 12514.

Information on obtaining the Coleman reprints will be supplied by the PHS library. Here the three 19th century titles can be examined, because the originals are out of circulation. The other three have been on the library shelves since publication decades ago.

●

Léonie Bell is a noted botanical illustrator and an avid old rose researcher. She wrote the introduction to two of the new editions of the books mentioned in the manuscript: *Old Roses* by Ethelyn Emery Keays and *The Rose Fancier's Manual* by Catherine Frances Gore.



Title page from Boitard's *Manuel des Roses,* 1836. Author photo, courtesy MHS Library. Actual size.

We Have the Wish to Make a Garden

by Jane Lennon

photo by Patrick Radebaugh

Webster Place completed. (All black and white photos were taken in winter.)

We have the wish to make a garden. There is a nice little lot behind our church. When we fixed up this church building we put a hose connection near the back window and we got a good old lawn mower. We'd like some green grass and flowers and to pretty up this lot.

Sincerely,

Mary Sturgis and the Mt. Horeb Church and the neighbors

Creating Sitting Gardens from rubble-strewn lots is one objective of the Philadelphia Green program.

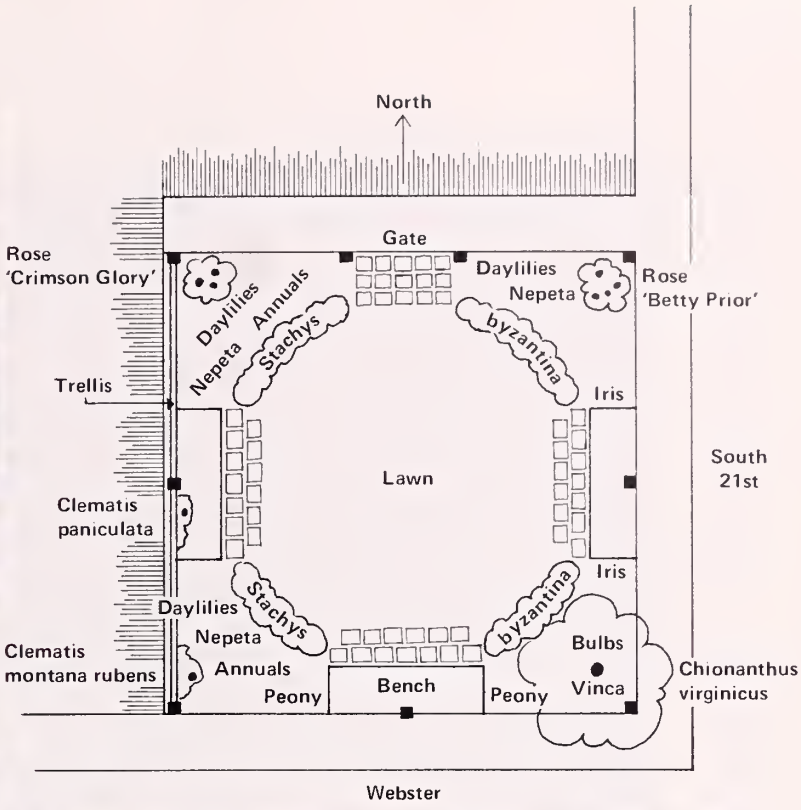
Last May, I met with the aspiring gardeners on their tiny 15 ft. x 15 ft. lot. We gave the lot a close critical look and talked about the work to be done before any real gardening could begin. We made a date for the first work day.

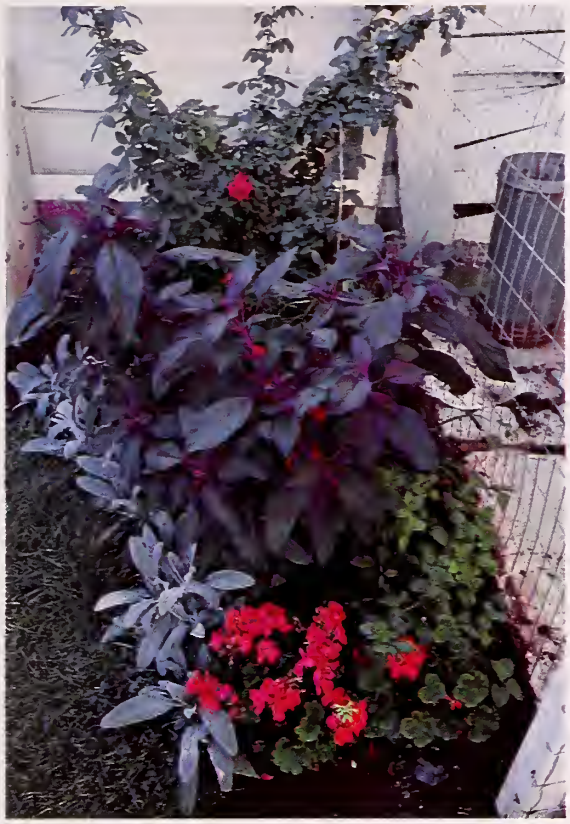
In the meantime, we agreed that I would draw a ground plan and the residents would make a "wish list." When I left we all had a good understanding of the work involved in preparing an ex-cellar for planting, and we all were ready and willing to do that work. As I was getting into the car, Mrs. Sturgis, the leader of the group called, "Mark August 5th on your calendar; we'll dedicate our garden then, God willing."

I returned about a week later with the ground plan carefully delineating the limits of reality. The gardeners had prepared their wish list: green grass, shade, lots of color, seats for relaxing, hide the ugly shed, things that smell good, flowers to cut for the church, a place to do some digging and weeding.

We worked on the lot, and when we

ite preparation at Webster Place





Climbing Rose 'Crimson Glory,' an amaranth seedling. *Stachys byzantina* edge the lawn. Geraniums in the foreground.

photo supplied by Jane Pepper

Relaxing at Webster Place. On the left, clematis reaches up the trellis.

were hot or tired we worked on the plan. Non-gardening neighbors stopped to chat and brought pitchers of ice water to cool us off. We dug the rubble down to below sidewalk level and the ground plan began to fill in. A round lawn would occupy most of the surface of the lot. A trellis was the answer to the ugly shed problem and would provide vertical space for flowers. A small slow growing tree for shade at the southeast corner, benches three sides around and the gateway on the fourth.

Posts for the fence and trellis were set, the ugly shed was wire brushed, primed and painted, and cobbles were set around the perimeter of the lot. During these bright hot work days we talked about plants and perused nursery catalogs over lunch. The neighbors became very aware of the plants they saw growing in city yards and parks. "I saw a vine covered with flowers like pink stars, can we grow that?" A *Clematis montana rubens,* perfect for the trellis.

continued

We Have the Wish continued

photo by Patrick Radebaugh

Hoopes Street Lunch Park, 48th & Hoopes Sts.

In June a truckload of topsoil and another of organic matter were delivered and spread and mixed and leveled. The garden was ready to plant.

With picnic lunches, copies of the ground plan and a tentative plant list, eight of the gardeners and I piled into the PHS van and drove out to Delaware County to Tyler Arboretum. We looked at the established plantings at Tyler, madly making notes and marveling at that garden's longevity—the marvel was that those plants were around so long after the people who planted them.* After lunch we went on to Rose Valley Nursery to look at their stock.

A rose 'Betty Prior' was selected for its long season of bloom, and a fringe tree *(Chionanthus virginicus)* for slow growing shade and deliciously fragrant bloom was tagged. For the trellis we chose the *Clematis montana rubens,* that a member of our group had noted earlier during its flowering season, a *Clematis paniculata* for fall flower interest and a climbing rose 'Crimson Glory.'

We also tagged two peonies, though their annual show was past. Peonies seem to be a sweet scented memory from everyone's childhood. We arranged a delivery date with the nursery and returned to Philadelphia.

We looked at other herbaceous plant material and noted what we particularly liked, with woolly lambs ears *(Stachys byzantina)* and daylilies *(Hemerocallis spp.)* at the top of everyone's lists. I'm sure that the fragrant billowing herb garden for the blind and daylily bed along the drive at Tyler influenced these choices. This plant material would come from several PHS members' gardens, and be dug as soon as we were ready for planting. Planting activities were well planned to make sure that all material was out of the ground for the shortest possible time. A daily watering schedule was arranged and carefully followed.

The last planting task was to lay sod. The soil was carefully raked, leveled and watered and the sod laid and trod down. Two small boys stood by and watched marveling that it was just like carpet. To the gardeners the sod was like magic. It was the last step in seeing their wish come true. A lawn with clean green grass is a real treasure to a city dweller with a tiny backyard or no yard at all. Flowers will grow in buckets or tubs but a real lawn won't. Two gardeners took their shoes off to stand and wiggle their toes in the grass.

The Philadelphia Green work crew made three benches and installed them in early July. On August 5th the garden was dedicated while it rained on and off and nobody minded a bit. On December 15 the annuals were laid low by frost and we planted bulbs but the 'Betty Prior' rose bloomed for Christmas.

The letter quoted at the beginning of this article was waiting for me when I arrived at PHS, the new coordinator of the Sitting Gardens Program, which is part of the Philadelphia Green. The Sitting Gardens program took form as the garden at 21st and Webster evolved.

During 1978 we worked with 10 groups. Each garden is different from the others. Each one reflects the wishes, the needs and the energy of the gardening group involved. Several gardens, like 21st and Webster, are completely planted but none are finished. Perhaps that is one of the best things about a garden, something that constantly grows and changes, cannot be finished.

●

*Eight years of speculative, tax delinquent ownership is the background of the 21st & Webster garden site. The City of Philadelphia and PHS have worked with community groups for neighborhood ownership of vacant and neglected properties. The lot at 810 South 21st Street was listed for Sheriff Sale in January 1979. The City did not buy it. The gardeners are now dependent on the good will of the new owner.

Jane Reed Lennon is the Philadelphia Green Sitting Gardens coordinator. In this position she shares her lifelong interest in plants and gardens with city residents.

liriope muscari

Park's seed catalog lists *Liriope muscari* as a perennial evergreen border plant for "full sun or deep shade in any kind of soil." At times I quibble with oversimplifications of growing suggestions in seed catalogs, but never with that one.

Liriope muscari, or lily turf, is a dark green, grasslike ground cover. It is a member of the Liliaceae family that is native to eastern Asia (China and Japan). It grows in burgeoning clumps about 12 in. tall with graceful, arching blades that sway in the breeze. In late August and September it puts up unobtrusive spikes of pale lavender flowers and these are followed by black berries, about the size of holly berries, that last most of the winter. It spreads by underground runners.

photo by George Harding

I started liriope from seed over 20 years ago, simply out of curiosity. First I tried it in a very shady area at the base of a stone wall behind my garden, under an old lilac. Growing conditions were close to ideal—a protected location and soil that was rich, loamy and, because of the shade, almost perpetually damp. The liriope flourished, so much so that in a few years runners were forever creeping into the narrow grass walk in front of the border. Eventually it got out of bounds. I knew it had to be moved. But where?

Across the entire frontage of my property, between the curb and the sidewalk, is a 30-in. wide strip that has always been a problem. Except for one small section partially shaded by a maple, the strip is in full sun all day. The soil is really dreadful—dry and shaley. All that would grow there were patches of clover and crabgrass. I decided to put liriope to the test. If it would grow in that strip, it would literally grow anywhere.

I dug all the clumps out of the area by the wall and pulled them apart into individual plants. Dividing took hours and I can't begin to guess how many plants I ended up with. There were baskets and baskets of them, enough to plant six abreast along about 120 ft. of the strip, roughly two-thirds of my road frontage. The plants were watered in well after planting, weeded the first two summers until the new clumps they formed usurped the empty spaces and the new border was firmly established; blistering sun, drought, dreadful soil and all. After the fourth or fifth summer I dug out plants creeping over the edge of the sidewalk and filled in the remainder of the strip.

On occasion school children have tramped through the liriope on their way home. Two or three times cars have jumped the curb and driven through it. But each time the trampling and the tire scars have vanished in little more than a month.

The real test of liriope's toughness, however, came in the brutal winters of the past two years. In addition to the bitter cold and frozen slush, it was showered day after day with salt or whatever melting compound Lower Merion Township uses to clear its streets. After all this abuse, only two small patches died back—certainly less than 4 per cent of the total. And those spots were easily filled in the spring by clump divisions.

To give the complete picture, I should add one small cautionary note. While liriope's foliage retains its dark green color well into midwinter, it does die back. Unlike ivy and pachysandra, the old foliage does not survive from growing season to growing season. In February, particularly after heavy snow, most of it is matted against the ground and drab. By late March, however, bright green spikes of new foliage are pushing up and soon masses of waving blades, denser than ever, are filling the area all over again.

George Harding

●

When he was young, George Harding's ambition was to be a farmer so that he could raise mashed potatoes and gravy, his food favorites at that time. When he was 10 years old, he grew pumpkins and sunflowers because he liked large, tangible results. Since then he has gardened and cared for house plants as time permitted.

symplocos paniculata

The sapphire berry tree was a great surprise when one late September day, soon after we had moved, I found the lovely blue sapphires covering the ground under two small trees. Robins and starlings were feasting on them.

Many of the trees and shrubs on our property were unfamiliar to me. The Frelinghuysen Arboretum in nearby Morristown, which I had joined, was most helpful in identifying them.

The tree was well named: sapphire berry or Asiatic sweetleaf *(Symplocos paniculata).* A native of China, Japan and the Himalayas, it was introduced into this country in 1875.

I waited anxiously for its blooming in the spring to capture the blossoms on film. In late May the dark green leathery leaves and small clusters of fuzzy white flowers with conspicuous stamens appeared and the blossoms were fragrant.

Because the blossoms and bright blue fruit rarely last longer than a week, the tree is not recommended for small gardens but I think the beauty for even a week is reward enough. It has the added advantage of being attractive to nearby song birds such as robins,

continued

photos by E. Marjorie Powell

Sapphire berry blossom

Sapphire berry fruit

thrushes, vireos, waxwings and brown thrashers.

I researched and found that our sapphire berry trees had been planted in 1942 and at that time were about 4 ft. high. They are now 20 to 25 ft. high and have several trunks measuring 15 to 18 in. in circumference. Quite a number of small trees have grown up elsewhere on the property, no doubt, planted by birds.

New plants can also be started from cuttings of young growth in spring or summer or by layering.

E. Marjorie Powell

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Marjorie Powell enjoys working in her garden, hiking and taking pictures, especially of wildflowers.

rubus idaeus

A raspberry bush is not a thing of beauty. I grow raspberries because the berries are delicious and very hard to come by in the markets.

So, if you want to grow raspberries try to find a place that is not the focal point in your garden and concentrate on keeping the bushes healthy and in control.

The best planting time is late fall or early spring. Our bushes are 'Heritage' Everbearing Red and they have provided us with two good crops each summer.

The bushes are planted in a single row about 3 ft. apart. We have two posts either side of the row every six feet. These posts are connected with strong wire 3 ft. and 5 ft. from the ground, and the canes are guided up between the wires making tying unnecessary. We find that keeps the raspberries looking neat and also makes the berries easy to reach for picking.

We fertilize our bushes in the spring with a 10-10-10 fertilizer, a good trowelful per plant. We keep them well mulched with salt hay throughout the summer as they require moisture to set their buds.

After the last berry has been picked we remove old canes and trim very long growth, which would be damaged over the winter. In late March or early April, when the plant is still dormant we cut all canes to 30 inches, feed and mulch and wait with happy anticipation for a summer of raspberries.

Anne Putnam

●

The raspberries that Anne Putnam grows surround two sides of a vegetable garden. In addition to her gardening activities, she has served on the PHS Council and the Long-Range Planning Committee; at present she serves on the Finance Committee and Flower & Garden Show Preview Dinner Committee. She is vice-chairman of the Chestnut Hill Hospital, where she is heading up a capital Fund Drive.

photo by Edward F. Beale

hedychium coronarium

Years ago, knowing my love for propagating seeds, cuttings and roots, my brother-in-law in California sent me an unidentified root with a challenge to do something about it. I potted it up using a blend of composting material and rich black earth. As the plant grew, it resembled a marsh grass, but when we were in Cypress Gardens, Florida, we saw a similar plant with lovely white blossom and we knew we had a ginger plant. In the spring and summer it's kept on the patio in full sun 30-40% of the day—the rest of the time it's in filtered sun. The root system became very vigorous, breaking successive pots, so I learned to trim the roots regularly. I repotted half of them and put the cutoffs in the freezer for use in the kitchen. The ginger plant bloomed for the second time last summer, turning a nondescript plant into a thing of beauty, with its pure white flowers and indescribably lovely scent.

Herbert Gullberg

●

Herbert Gullberg grows orchids and other plants in a converted porch and moves them to the patio when the season changes. He lives in Moylan.

photo by Herbert Gullberg

ODE TO THE TOAD, THE GARDENER'S HELPER

by Devon Reay

"Never saw such a quick toad, in a fraction of a second that running leap, or leaping run, sped him from the horseradish to the shade under the bush beans; some young rabbits don't move that fast," observed Teresa York, an eastern shore gardener who has encouraged toads for years. "Mottled brown, probably a Fowler's toad."

The toad deserves all the encouragement and protection we can provide; from late spring through mid-fall an adult toad, which is carnivorous, devours up to 16,000 garden pests such as potato beetles and cutworms, slugs and grubs, flies and grasshoppers. Actually, he aids the gardener more than any bird, and he is in the right spot at the right time—at dusk when the birds have quit for the day he emerges from his moist shelter to snatch anything in motion with his lightning-quick tongue. This tongue, which is attached to the floor of his mouth toward the front, appears even longer than it is since he casts its entire length out at his prey. Instantly the victim is done for, caught in the sticky substance that coats the amphibian's tongue.

Also, the toad is down under the foliage where insects are most likely to lurk. What bird investigates the underside of a bean leaf?

Toads absorb water through their skins which, to assimilate oxygen, must be moist; so throughout the hot, dry months the toad must have a dependable supply of fresh water. Before York set her 16-in., flat-bottom, yellow-clay birdbath on two firebricks just inside the vegetable garden, she provided a wide, upside down pyrex cover sunk in the earth so the rim was at ground level, a toad pool filled daily in warm weather. On hot days a toad sat almost motionless, half-submerged in the birdbath, which also offered protection in the moist shade below.

At certain times, the birds washed in and drank from the bath, which was cleaned weekly and also kept full of clean water—collected rainwater when available.

Except for the skunk and the hognose snake, which practically live on young toads, the toad has few enemies. Some years back, on a farm in Sullivan County, N.Y., the owner's young daughter cultivated the family vegetable garden. One year a large toad lived among the vegetables; he was a useful friend who devoured insect pests before they attacked the vegetation. One day the girl heard the family collie barking in the garden and ran out to investigate; a snake was swallowing her toad. After grabbing a hoe, she held the snake's head down with the flat of the blade with one hand and extricated her toad from the snake's mouth with the other.

Neither creature was hurt, but during the encounter her toad was not happy.

A more recent incident was perpetrated by a "patient" nature photographer. He dropped a hognose snake down among several captive Fowler's toads and reported, "Each went into the equivalent of hysterics—began to leap wildly about, and within moments all had turned a pale, ghostlike beige." Surely a photographer can better occupy his time than aggravate and so terrify a beneficial amphibian that it turns pale with fear.

. . . an adult toad . . . devours up to 16,000 garden pests such as potato beetles and cutworms, slugs and grubs, flies and grasshoppers.

Fowler's toad, *Bufo woodhousei fowleri,* is from two to three inches long, smaller than the American toad. His head is more rounded than that of American and he is usually brown or

continued

photo by Vic Twilley

continued

gray with a light stripe the length of his back. Underneath he is creamy or off-white and his voice, compared with the musical trill of American toad, a harsh bleat. While foraging he retains a 75° body temperature, and he breeds before pond water is much above 60°, later than American which stands colder temperatures.

American toads generally live on high ground in hilly regions from northern New England to Georgia while Fowler's toads are found on flat sandy land not far from water from southern New England to Georgia, and west to Michigan and eastern Texas.

York's two-lot yard is a quarter mile from a two-mile long pond. Before the unusual winters of 1976-77 and 1977-78 seven or eight Fowler's toads lived happily in her garden while others foraged among the perennials that screened the brick house foundation on three sides. During the cold months they hibernated in the soft earth, barely covered with grass, northeast of the garage, after digging in backward diagonally. For years the ground never really froze, except perhaps an inch down for a few days, so the toads never dug very deeply.

In spring, 1977, only two toads lived in the York garden, and two Fowler's and one American toad the following spring. Also a plump hognose snake, but she did not see him until midsummer. "The ground froze more than six inches deep that first winter. And

After grabbing a hoe, she held the snake's head down with the flat of the blade with one hand and extricated her toad from the snake's mouth with the other.

the winter of '78 was colder," said York, "Those toads never emerged from hibernation."

For centuries the Chinese used dried toad poison to cure a number of maladies. And toads have long been an asset to the farmer; during insect plagues the amphibians devour the dominant insect, thus helping restore the balance of nature. Species such as the giant toad were imported to control agricultural pests. But on today's commercial farm how can the toad survive? Ponds have been drained, few hedges or wild strips separate the acres and acres of corn and soybeans, and if the heavy equipment does not annihilate him, the chemicals and herbicides will.

"Destruction of toads by trucks and other vehicles is minor compared to that by insecticides—misguided spraying of swamps and ponds kills hordes of amphibians," according to a researcher who says toad populations never recover when their habitats are destroyed as so many have been.

He searches space with bulbous eyes
For victims he can gourmandize,
He's full of aim and enterprise
And also ex-mosquitoes.

—Ernest Altrew

(Ernest Altrew is the pen name of a Canadian prospector who was born before 1877. He is probably still writing verse.)

●

Devon Reay is a free-lance writer and New England gardener who lived in southern New Hampshire and eastern Massachusetts until 1973. Since moving to the Delmarva Peninsula (Maryland) her articles have appeared in *Frontiers* and *Country Scene, Delaware Today* and *Maryland Conservationist,* but mostly in the garden pages of the *Christian Science Monitor.*

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Curtsying painted daisies with Iris 'Tom Tit.' See page 14.

THE green scene

HORTICULTURE IN THE DELAWARE VALLEY

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Growing Plants in Containers

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THE green scene

HORTICULTURE IN THE DELAWARE VALLEY

Volume 7, Number 6 July/August 1979

published by
THE PENNSYLVANIA
HORTICULTURAL SOCIETY
325 Walnut Street, Philadelphia, Pa. 19106

THE GREEN SCENE, (USPS 955580) Volume 7, No. 6, published bimonthly, January, March, May, July, September, November, by the Pennsylvania Horticultural Society, a non-profit membership organization at 325 Walnut Street, Philadelphia, PA 19106. Subscription: $7.50 — Single Copy: $1.50. Second class postage paid at Philadelphia, PA 19104.

POSTMASTER: Send Form No. 3579 to THE GREEN SCENE, 325 Walnut Street, Philadelphia, Pa. 19106.

in this issue

Front Cover: Gloxinia hybrid photographed at Meadowbrook Farm by Edmund B. Gilchrist, Jr.

CORRECTION: The holly on page 21 of the May issue of *Green Scene* should have been identified as *Ilex cornuta* 'Rotunda' not 'Burfordii.'

GROWING PLANTS IN CONTAINERS

by Ernesta D. Ballard

A word of introduction may be helpful to explain what we are doing in this issue.

In the first place, this is not a manual of how to grow plants indoors. The intertwined constraints of light, temperature and humidity and the do's and don'ts of fertilizing and pest control are an oft-told tale and are not being repeated here. You will find them in books and periodicals in our library by the score.

Nor is this a treatise on pruning and shaping. We leave those subjects to specialized works on bonsai and topiary.

Rather, this issue is addressed to those who are already (in the modern phrase) "hooked" on container gardening indoors or out. Our purpose is to stimulate, to suggest new avenues for exploration, to convey a sense of the things that can be done with plants in containers and the satisfaction awaiting those who venture further into this field.

Thus, Dr. Brubaker in his article on page 5 reminds us that there are scientific reasons for most of the practices and techniques of the container gardeners. The implication is that many of us would get better results (and incidentally broaden our understanding of horticulture) if we would inquire a little into plant physiology.

On the other hand the survey on soils illustrates that horticulture is by no means an exact science. There is ample room for trial and error and individual preference. The contributors to the survey include some of the most successful growers in the Delaware Valley. Yet no two of them agree absolutely as to the best mixture to grow in. Would it be heresy to suggest that the composition of the growing medium is really not important, so long as it provides a firm anchorage for the plant, retains adequate moisture, and allows reasonable passage of oxygen and carbon dioxide?

The heart of this issue of *Green Scene* is the pictures. We are proceeding on the basis that each of them is worth a thousand words. But this will apply only if you study them. They are designed to show the variety of effects that can be achieved and the range of tastes that can be satisfied.

The interests that lead people to grow plants in containers are as diverse as people themselves. Many of us enjoy having precious plants from foreign climes, like the myrrh trees imported by Queen Hatshepsut from the Land of Punt in 1500 B.C. Or the breadfruit trees that figured in *Mutiny on the Bounty.* Others see in potted plants a medium from which to create aesthetic compositions in which the pattern and texture of the plant are enhanced by the shape and color of the container. Bonsai is probably the most familiar example, but there are a vast number of other opportunities. Think of the potted trees in the Moorish gardens of Spain, or even at Versailles.

Others of us are collectors, using pots largely as a device for compressing into manageable space an array of trees and shrubs that occupy acres in nature.

And finally we come to the most numerous group of all, those who simply enjoy having potted plants around the house or office. For many of these people, looks seem to mean nothing. All that counts is the presence of a living thing. I have been amused to see in the oriental wing of a first class museum, bamboos in green tin cans, standing next to paintings of lovely porcelain containers created for the purpose. And who has not noted the contrast between the interior designer's concept of lush greenery and the dreary dracenas that embody that concept in the finished office or store.

In some ways potted plants can be said to resemble pets. Like pets, they are dependent on their owners for sustenance. They require attention and repay it by living and growing. They respond to grooming. Some are thoroughbreds, elegant and aristocratic. Others are mutts, homely and amusing. There is no more need to explain the domestication of plants than the domestication of dogs. Both are a part of the human condition.

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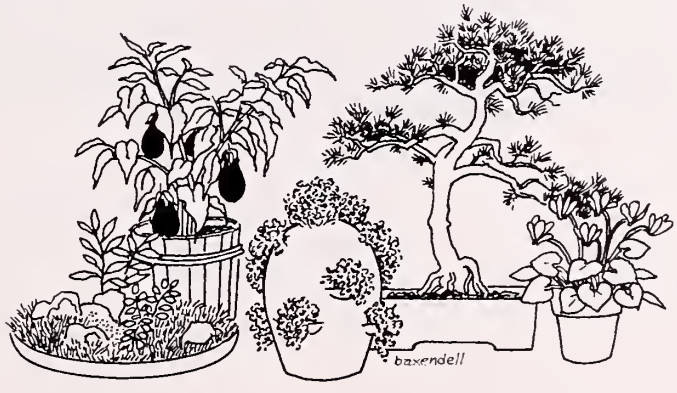
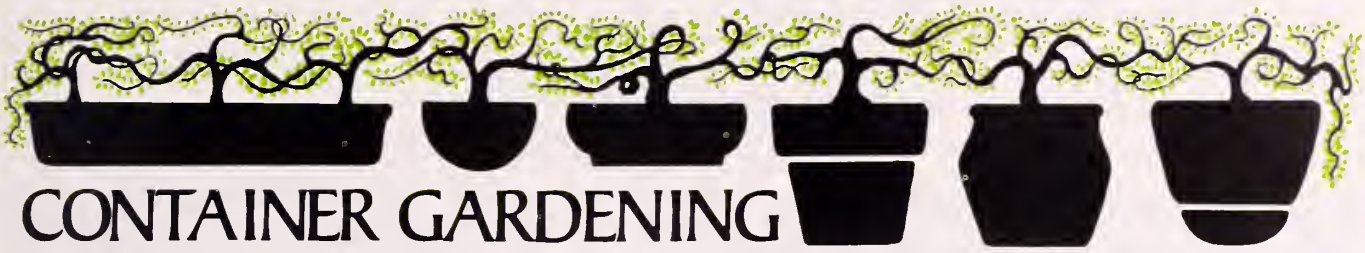


From the riverbank, from the woods, from the windswept mountaintops to the open countryside comes inspiration for growing plants in containers. The trained eye and imagination of PHS member W. Flook, Jr., caught this handsome natural planting of wild flower seedlings—monkey flowers *(Mimulus guttatus)* and orchids—perfectly settled in a log in Oregon.

drawing by Jay Gallagher



CONTAINER GARDENING

by M. M. Brubaker

Growing plants to perfection in containers requires practices that are very different from growing in ground beds. What might be considered a fine quality garden soil is generally not suitable for use in a pot without considerable modification. The reasons for this difference are complicated like the soil itself. The ground bed can be viewed as having a deep capillary sump. In the potting medium this effect is simulated by increasing the porosity or aeration, and mixing in additional organic matter.

The classical potting medium for containers has been for many years a mixture of: (1) garden soil, (2) organic matter such as leaf mold, rotted manure, or peat moss, and (3) sand, all in the proportion of 1:1:1 or 2:1:1, depending on the nature of the garden soil. In the 1930s the John Innes Horticultural Institution of England undertook to standarize the art of building a potting mix. The outcome was their "John Innes Potting Compost" (Ref. 1). Their specific recommendations are hardly practical for the casual gardener, but can provide a guide and an appreciation of the container problem. In essence, a specially composted loam is mixed with peat and sand in the proportion of 7:3:2, and a fertilizer base of superphosphate, horn and hoof, and potassium sulfate is mixed in along with limestone. The mixture then receives a carefully controlled "sterilization."

Even though quite precise, the John Innes potting mix depended on a garden soil that can never be standardized. Another episode came with the publication of *The U.C.* [University of California] *System for Producing Healthy Container-Grown Plants* in 1957 (Ref. 2). This system was designed to eliminate the complicated variations inherent in soil, manure, or leaf mold. Combinations of peat and sand are mixed with superphosphate, dried blood (or horn and hoof), potassium sulfate, and limestone.

A more recent recommendation for a potting medium was issued by Cornell University, and is now generally referred to as the "Peat-Lite" mix (Ref. 3). It is based on equal parts of peat and vermiculite (or perlite) mixed with fertilizer components and limestone.

A potting mix containing garden soil should be pasteurized to eliminate weeds, many disease organisms, insects, and nematodes. Often people erroneously refer to pasteurization as sterilization; to pasteurize, heat to about 180°F (82°C). Too high a temperature (above 180°F) introduced new complications such as destruction of beneficial bacteria and formation of components toxic to plants.

For many purposes, mixes of the peat-lite type can be used without "sterilizing." (Fungicide treatment should, of course, be used when seeds are germinated.) There are now on the market a number of artificial mixes ready for use in containers. These include "Promix," "Metro-Mix," "Jiffy-Mix," "Redi-earth," and "Choice Nursery Mix." They are increasingly used by commercial greenhouse growers because they can be more economical than digging up good soil, mixing, and "sterilizing." Likewise, it is often more practical for the home gardener to buy a complete mix. "Pro-Mix" and "Redi-earth" are similar to the Cornell peat-lite.

Vanda growers in Indonesia say that, for best flowering, their indoor plants must be shaken or vibrated frequently to simulate wind action.

Some experienced greenhouse growers still consider their own mixes based on garden soil superior to the artificial mixes. This introduces another profound difference between in-ground growing and container growing—the matter of nutrient logistics. This too is a complicated subject involving ion exchange, chelating agents, capillary forces, buffers, and the action of microorganisms. In short, natural soils may offer better nutrient logistics than artificial mixes, and allow more leeway in fertilizing practices. The discussion below is therefore aimed particularly at fertilizing techniques for plants in artificial potting media.

fertilizers

With hungry plants like chrysanthemums, in a peat-lite mix, you get best results by including fertilizer each time you water the plants. This technique, called constant fertilization, is commonly used now in commercial greenhouse growing. A concentrated solution of a soluble fertilizer is fed into a proportioner connected to the water supply, and the effluent for watering plants contains ordinarily about 200 parts per million of nitrogen and of potash. This corresponds to about one teaspoon of a 20:20:20 soluble fertilizer in a gallon of water (1.0 gr. per liter).

It is practical to incorporate sufficient superphosphate or bone meal in the container mix to supply phosphorus gradually for a considerable period. The action of horn and hoof or blood is dependent on slow decomposition by microorganisms to yield nitrogen, and this is intended to give an effect something like the availability of nitrogen in ground beds. Three forms of slow-release potassium have been offered the container grower: "Magamp," which also contains nitrogen and phosphorus, Peter's fritted

continued

potash, and "Dura-K." Most of the commercial potting mixes, however, include potassium sulfate as a source of potassium. In an artificial mix, this soluble form of potassium washes out and should be replenished frequently. With slower growing plants or those in low light, a simple way to apply nutrients gradually is to add an encapsulated fertilizer like "Osmocote" to the surface of the potting mix.

Enthusiastic gardeners often have a heavy hand when it comes to fertilizing. Additional fertilizer is considered a panacea for plant ills. House plants are more likely to suffer from too much fertilizer than from too little. Accumulation of fertilizer residue in the potting medium can be a cause of suffering, especially when it is too much trouble to take the plant to the sink occasionally and rinse out the roots. Whatever fertilizing practice is followed, it should be kept in mind that an abundance of nitrogen ordinarily stimulates vegetative growth, but with some plants it decreases, or may even prevent flowering and fruit bearing. This is particularly true of tomato plants grown in tubs. Too much nitrogen will create a beautiful dark green plant with very little fruit.

Be garrulous, speak vehemently, and get down close so the leaves can use most efficiently all the carbon dioxide in your breath.

"Complete" or "balanced" fertilizers of the soluble type are often deficient, especially in calcium. This element should be adequately supplied by including limestone or gypsum in the container mix. Magnesium should also be included by using a dolomitic type of limestone. The University of California considered a deficiency of minor elements improbable if the artificial mix contained considerable organic matter and bacterial action. However, there have been reports of boron deficiency in plants grown in a peat-lite type of mix. I believe the commercially available potting mixes mentioned above are supplied with an adequate combination of trace elements.

watering

Good container growing demands accurate watering. The manner of watering has an important influence on root chemistry. For example, root respiration and bacterial growth in the potting medium require oxygen, and the root area of most actively growing plants must dry out to some extent to suck in air, like the inhaling lung. A thorough watering then drives out the byproduct of respiration, carbon dioxide, as in the exhaling lung. Thorough watering has still another important function in container growing: to wash out the accumulation of soluble salts left over from unused fertilizer components and from evaporating water. When constant fertilization is practiced, about a fifth of the liquid added each watering should drain out of the bottom of the container to avoid accumulation of salts.

temperature

There are worthwhile opportunities to manipulate temperature with container grown plants. For example, early crops of tomatoes or squash are dependent on high light and warm nights. This can be accomplished in the early part of the growing season by moving tubs of these vegetables into full sun in the daytime and into a warm garage at night. By using this technique, we start eating zucchini from tubs about the middle of May each year.

light

New growth on plants reaches out towards the direction of brightest light. It is common practice to turn house plants frequently so that they will develop uniformly on all sides. This practice may be undesirable for some plants grown outdoors in full sun. Chlorophyll and protective pigments arrange themselves in the leaf to adapt to a particular light exposure, and change in the plant orientation may cause sunburn. Likewise leaves that have grown up in low light may not tolerate high light even though the plant that bears them is known to do well in high light. A desirable arrangement of flowers on a spike may also depend on unchanged orientation.

"wind" action

Vanda growers in Indonesia say that, for best flowering, their indoor plants must be shaken or vibrated frequently to simulate wind action. Experiments on greenhouse plants have shown that mechanical manipulation will alter the manner of growth. If you have time to agitate your plants frequently during the day, you may get a better or differently shaped plant, but don't depend on this for optimum flowering.

growth regulators

Quite a number of new chemicals for the container grower have come out of research on plant growth regulators. Beta-naphthoxyacetic acid ("Blossom-Set") acts like an artificial pollen, and will induce early fruit formation on tomatoes and peppers when there is a scarcity of pollinating insects. Dwarfing chemicals like "A-Resr," "B-Nine," and "Cycocel" can be tried by venturesome growers for limiting the size of potted plants. These dwarfing agents are used extensively on commercially grown chrysanthemums and poinsettias, but little is known about their action on many plants of interest to the amateur.

Professor Stanley Ries of Michigan State University has recently reported that the growth of many plants can be stimulated by the application of an alfalfa extract. If a concoction containing this chemical is made available for gardeners, I'm sure none of the benefits will be lost in the description.

Commercial growers "feed" plants carbon dioxide to attain maximum photosynthesis. For the home gardener, I recommend talking to your plants. Be garrulous, speak vehemently, and get down close so the leaves can use most efficiently all the carbon dioxide in your breath.

●

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CONTAINER GROWN PLANTS – MOVABLE GARDENS

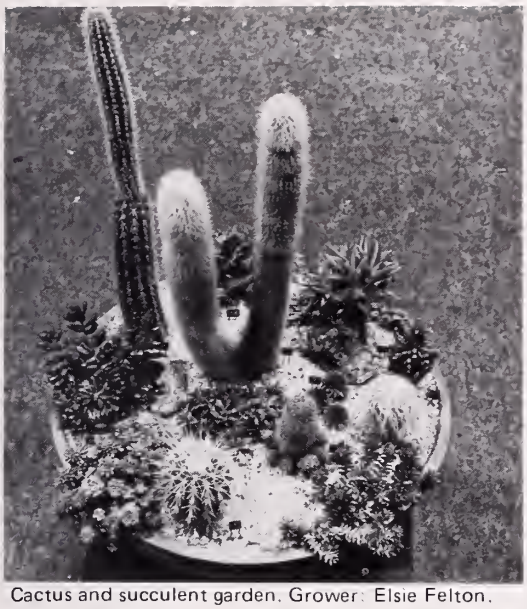


photo by Steven Goldblatt

Cactus and succulent garden. Grower: Elsie Felton.

photo by Edmund B. Gilchrist, Jr.

Pilea depressa in a handmade pottery container.

photo by Edmund B. Gilchrist, Jr.

Schefflera actinophylla in a chinese porcelain container.

Pansies at Nemours Gardens in Wilmington.

photo by Darrel Apps

photo by Edmund B. Gilchrist, Jr.

Lantana camara. Grown by Sally Reath.

photo by Edmund B. Gilchrist, Jr.

Tropaeolum x 'Primrose' photographed at Meadowbrook Farm.

◀ Ferns: (left) *Polypodium aureum* 'Mandaianum' (blue fern); (right) *Polypodium subauriculatum* 'Knightiae'

▲ *Platycerium grande*

◀ Ferns on the left: *Nephrolepsis exaltata* 'Verona'; center: *Ficus nitida;* right: *Aspidistra eliator*

photos by Edmund B. Gilchrist, Jr.

Grower: Ernesta D. Ballard

A chestnut tree stump found in the woods and decontaminated over a year is a container for small orchids, including equitant oncidiums, dendrobiums and others. Grower is Robert W. Preucel.

Alyssum 'Tom Thumb'

photos by Edmund B. Gilchrist, Jr.

photo by Edmund B. Gilchrist, Jr.

◀ *Cineraria maritima* grown at Meadowbrook Farm.

◀ *Petunia* 'Paleface'

photo by Darrel Apps

▲ Dracena, coleus and geranium

photo supplied by Longwood Gardens

◀ Poinsettia display at Longwood Gardens

PLANTS IN POTS CAN BE LIVING SCULPTURE

Lygodium scandens supported by a rhododendron plant stem.

Cascading chrysanthemums grown by Sally Reath.

photos by Edmund B. Gilchrist, Jr.

Blue ribbon lion topiary designed and grown by Kenneth H. Gordon, Jr. Lion's mane is Kenilworth ivy *(Cymbalaria muralis)* and the body is made from baby's tears *(Soleirolia soleirolii)*. Pyramidal plant near lion is Dorothy P. Keith's *Rosmarinus officinalis.*

photo by Edmund B. Gilchrist, Jr.

photo by Edmund B. Gilchrist, Jr.

Myrtus communis 'Microphylla,' Mediterranean myrtle, twin topiaries. Grower: Sally Reath.

Rosmarinus officinalis topiary, designed and grown by Sally Reath.

PLANTS IN POTS continued

Seal topiary of small-leaved ivy *Hedera helix* 'Shamrock,' made by Dorothy W. Haas.

photo by Edmund B. Gilchrist, Jr.

Rosemary topiary

Chair designed and grown by Herbert Schiffer. Creeping fig *(Ficus pumila)* and baby's tears *(Soleirolia soleirolii)*.

Vertical garden of *Begonia semperflorens* in form of barber pole.

photo by James K. Rathmell

Echeveria gibbiflora 'Metallica,' grown by Sally Reath.

photo by Edmund B. Gilchrist, Jr.

photo supplied by Longwood Gardens

Cascading chrysanthemum display at Longwood Gardens.

PREFERRED SOIL MIXES FOR CONTAINER GARDENING

In his article on page 5 , M. M. Brubaker outlines the reasons why plants grown in containers require soil unlike that in which plants grow outdoors. To prepare for this issue of *Green Scene,* we queried a diverse group of 12 growers about their soil formulas and found the variations to be a mixed bag with moderate variations when growing the same kind of plants (for example, succulents, cacti, orchids, tropicals, alpines); major differences occurred, of course, when the plant types were substantially different. Six of the 12 persons (see box) answering the questionnaires had their own compost pile from which they drew 1/3 to 4/5 of the material for the containers. Baccto and Promix seem to be the favored commercial soil mixes used with either perlite or coarse sand.

eclectics

The soil formulas used by those who considered themselves to be eclectics rather than specialists varied slightly more than one would expect. For example, here are formulas submitted by three top growers who have often won blue ribbons at the Philadelphia Flower and Garden Show. Consider them individualists, pragmatists or what you will, what they do works for them.

The first grower says she grows every kind of plant possible in containers and finds the following formula works for her: she mixes four parts compost to one part sand. The compost is accumulated for a year and is made up of dead and discarded plants and clippings. She does not use leaves. She sterilizes the compost in an electric soil sterilizer or with larvacide to remove weed seeds. If some of the plants require a very acid soil, the grower uses pure oak leaf mold. For newly rooted tropical plants or when in a hurry, she uses sphagnum moss.

Two other equally eclectic growers vary the formulas: the second grower uses one part perlite, one part builders' sand and one part compost (everything healthy that is tossed from the greenhouse and all garbage except cooked food and meat). Occasionally she uses peatmoss in lieu of perlite. For succulents she adds more sand and finely broken pot shards.

The third variant is one-half sifted soil, one-half sifted compost. This grower varies the mix with one part sand according to the cultural needs of the plant.

specialists

The three formulas listed above are fairly basic. However, we've also singled out three specialists from those we queried: Helen Fogg, Anita Kistler and Dorothy Young.

Helen Fogg specializes in cacti and other succulents. She uses equal parts of Bakkto soil and clean river sand. She mixes in two tablespoons of gypsum, two tablespoons of cow manure, three tablespoons of superphosphate, one-half cup of charcoal and one-half cup of camphor crystals to prevent root mealy bug. For jungle cactus she uses a richer mixture of Bakkto than sand and adds more cow manure.

For her alpine and rock garden plants, Anita Kistler uses one part garden loam, one part humus (from the compost pile) and 1½ parts baby chick (starter) grani-i-grit, which is larger and sharper than sand. She uses more grit for the dry land plants, more humus (leaf mold) for the primulas and less loam and more grit for the alpines.

The third person in this group is Dorothy Young who specializes in bonsai, mostly hardy, winter-dormant trees. Young notes that she uses equal parts by volume: topsoil, shredded sphagnum, peatmoss (sifted through 3/8 inch mesh to remove debris) and clean, coarse sand. Young sifts the soil through a fine mesh to remove powdery dust. Everything is mixed dry.

This mix is varied for rhododendron and other ericaceous plants. For these she uses two parts peatmoss to one part topsoil and one part coarse sand. For the bonsai pines, she doubles the ratio of coarse sand to equal parts of topsoil and peatmoss.

fertilizers

Styles of fertilizing varied considerably as well. The consistent message was to fertilize during the active growing season, which is loosely construed to be from mid-February to mid-October. Some people fertilize with every watering, others every two weeks. Anita Kistler, who says her plants (alpine and rock garden) are used to "lean growing conditions in nature," fertilizes *twice during the summer.*

Bonsai specialist Dorothy Young had a very precise schedule: once every other week, May, June, July and August, and once only in November. She does not fertilize in December, January, February, March, April, September and October.

Peter's Special was the predominant choice of fertilizer among those who responded to the questionnaire. Dorothy Keith prefers "Spoonit" all purpose plant food, which contains chelated iron. Mentioned less frequently were Miracle Grow and Hyponex.

Clearly, with such a narrow test group the brands mentioned here do not qualify as an official endorsement.

kind of containers

To a person the respondents preferred porous to non-porous containers, although as one grower wrote "many superb growers have used glazed or plastic containers successfully." No one, but no one, answered "yes" to the question "Do you grow plants in containers without drainage holes?"

●

Participants in Soil Preferences Survey

Ernesta D. Ballard
J. Blaine Bonham
Cecily G. Clark
Helen Fogg
Dorothy S. Keith
Anita H. Kistler
Ed Lindemann
Joanne Crouse Marano
Sally Reath
Charles W. Rogers
Dorothy S. Young
L. Wilbur Zimmerman

BONSAI - EPITOME OF POTTED PLANTS

photo by R. Luther Young

Chamaecyparis thyoides (New Jersey white cedar). Grower Dorothy S. Young.

BONSAI - EPITOME OF POTTED PLANTS
continued

photo by R. Luther Young

Cedrus atlantica 'Glauca,' grown by Frederic L. Ballard.

Virginia creeper *(Parthenocissus quinquefolia)* collected and grown by Jerald P. Stowell.

Crab apple *(Malus sp.)* grown by Jerald P. Stowell.

photo by R. Luther Young

Gingko biloba, center. Grown by Frederic L. Ballard.

▲ Apple tree *(Malus sp.)* and quaker ladies *(Hedyotis coerulea)*.

◀ Flowering azalea *(Rhododendron sp.)* nursery stock, grown by Jerald P. Stowell.

BONSAI - EPITOME OF POTTED PLANTS

continued

photo by Edmund B. Gilchrist, Jr

Pomegranate *(Punica granatum)*

photo by R. Luther Young

Pinus ponderosa grown by Ralph Walker

photo by Edmund B. Gilchrist, Jr.

Araucaria bidwillii

photos by Edmund B. Gilchrist, Jr.

Malus 'Red Jade'

Crassula argentea

Gardenia jasminoides

MINIATURE GARDENS AND LANDSCAPES

In trough gardens, it's important to use compatible plants. Plants that Anita Kistler used in these troughs are: saxifrage, alpine festuca, campanula, dianthus, tiny sedum, gentian and primula.

photos supplied by Anita Kistler

photo by R. Luther Young

A frisbee is used as a container for a picnic centerpiece. Bonsai-trained Dorothy Young was able to create this temporary container, giving an illusion of space, by using materials at hand: ordinary rye grass, large chinese box orange seedlings *(Severina buxifolia)* and artillery plant *(Pilea microphylla)*.

photo by Salter

Jean Salter's water garden contains dwarf acorus and salvinia. The handmade clay container is watertight.

MINIATURE GARDENS AND LANDSCAPES
continued

Created by Margery Edgren

Antique outdoor English sink planted by Ernesta D. Ballard

Created by Ernesta D. Ballard

photos by Edmund B. Gilchrist, Jr.

Created by Margery Edgren

The plants used in all of these containers are generally hardy, small-leaved rock garden plants, which get bigger by spreading outward rather than growing upward. Some good genera for these gardens are:

Trees and shrubs (all dwarf forms)

Juniperus
Ilex
Chamaecyparis
Buxus
Rhododendron

Herbaceous plants

Androsace
Arenaria
Draba
Mentha
Thymus
Primula
Arabis
Acorus
Gypsophila

Created by Anita Kistler

Terrariums of all sizes and shapes are always popular at the Philadelphia Flower & Garden Show. Miniature and slow-growing tropical plants are best. Some that we recommend are:

Tree-like
dwarf euonymus
pilea
polyscia

Ground cover
selaginella
baby's tears
miniature creeping fig

Flowering
miniature african violets
miniature gloxinias

Small foliage
peperomia
small-leaved begonia
prayer plant
moss

EDIBLES IN CONTAINERS

photo by Lois A. Stringer

Group of container-grown vegetables: Swiss chard, Burpee's rhubarb, extra curled dwarf parsley, peppers and eggplant.

photo by Lois A. Stringer

Burpee's Pixie Hybrid Tomato

Charlotte Archer picks bibb lettuce grown in a basket in her driveway.

Brussels sprouts grown in a 12-inch container.

photo by Edmund B. Gilchrist, Jr.

Planter box converted from a sandbox for vegetables.

photo by Lois A. Stringer

Tomatoes and cucumbers

Burpee hybrid eggplant

◀ Sweet banana pepper

Concord grape. Grower: Ernesta D. Ballard.
▼

photo by Edmund B. Gilchrist, Jr.

Zucchini

EDIBLES IN CONTAINERS
continued

Pepper: Tasty Hybrid

photo supplied by W. Atlee Burpee Co.

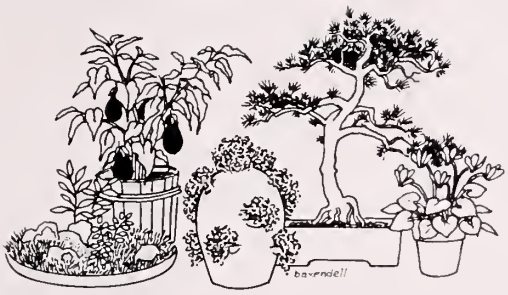
Cantaloupe

photo supplied by W. Atlee Burpee Co.

Lettuce wall

photo supplied by W. Atlee Burpee Co.

Cabbage: Stonehead Hybrid



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ALPINES IN CONTAINERS

Grower of the alpines: Roxie Gevjan

Orchis mascula

Anemone lesseri

photos by A. Gevjan

Cyclamen cilicium on greenhouse bench

Crocus imperati

Primula allionii

Draba mollisima

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THE green scene

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SUBJECTS

AUTHORS

Bonsai created from an apple tree dug up
in an old orchard by Jerald P. Stowell